run 5

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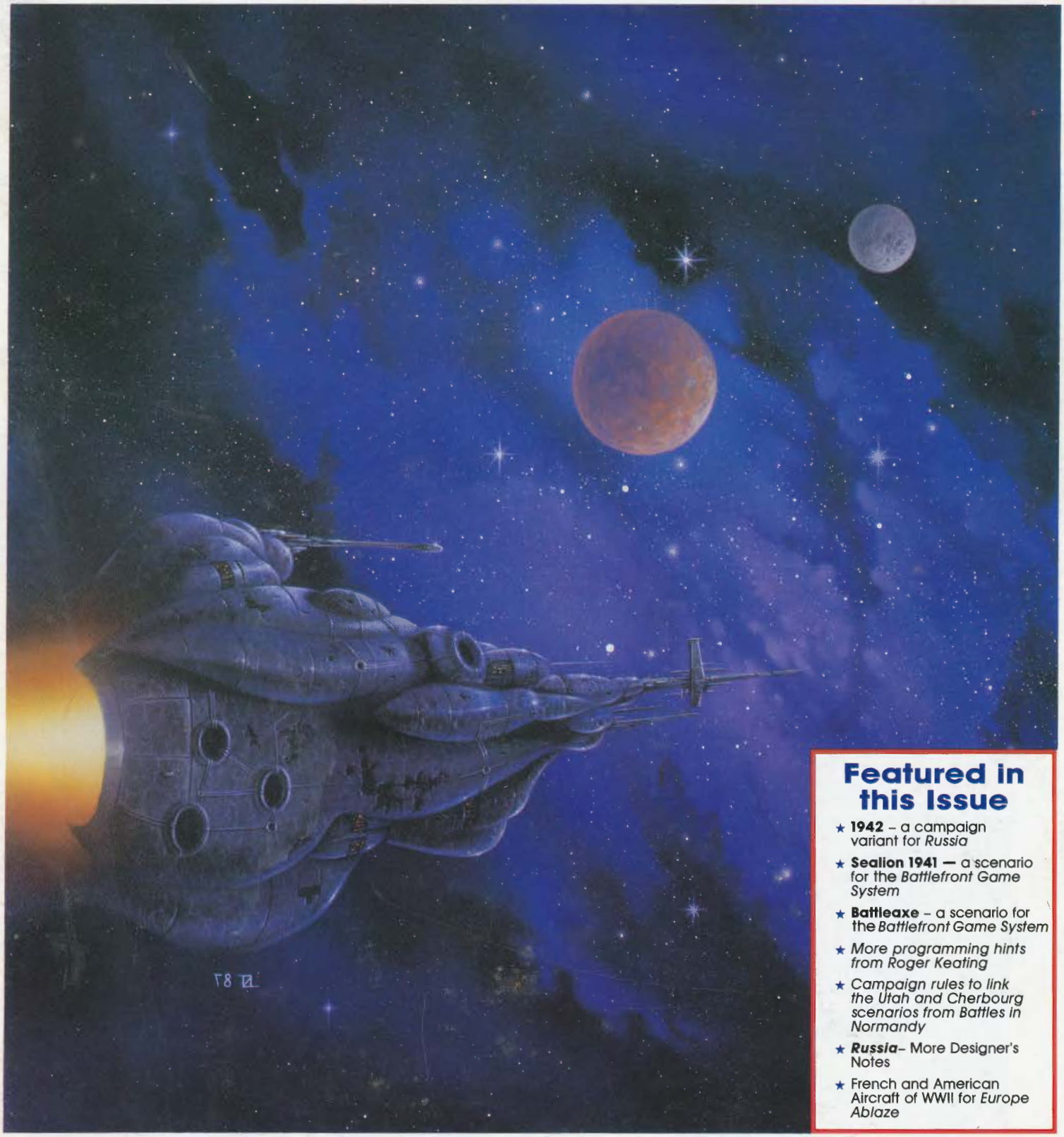

Featured in this Issue

- ★ **1942** – a campaign variant for *Russia*
- ★ **Sealion 1941 —** a scenario for the *Battlefront Game System*
- ★ **Battleaxe** – a scenario for the *Battlefront Game System*
- ★ *More programming hints from Roger Keating*
- ★ *Campaign rules to link the Utah and Cherbourg scenarios from Battles in Normandy*
- ★ ***Russia***– More Designer's Notes
- ★ French and American Aircraft of WWII for *Europe Ablaze*

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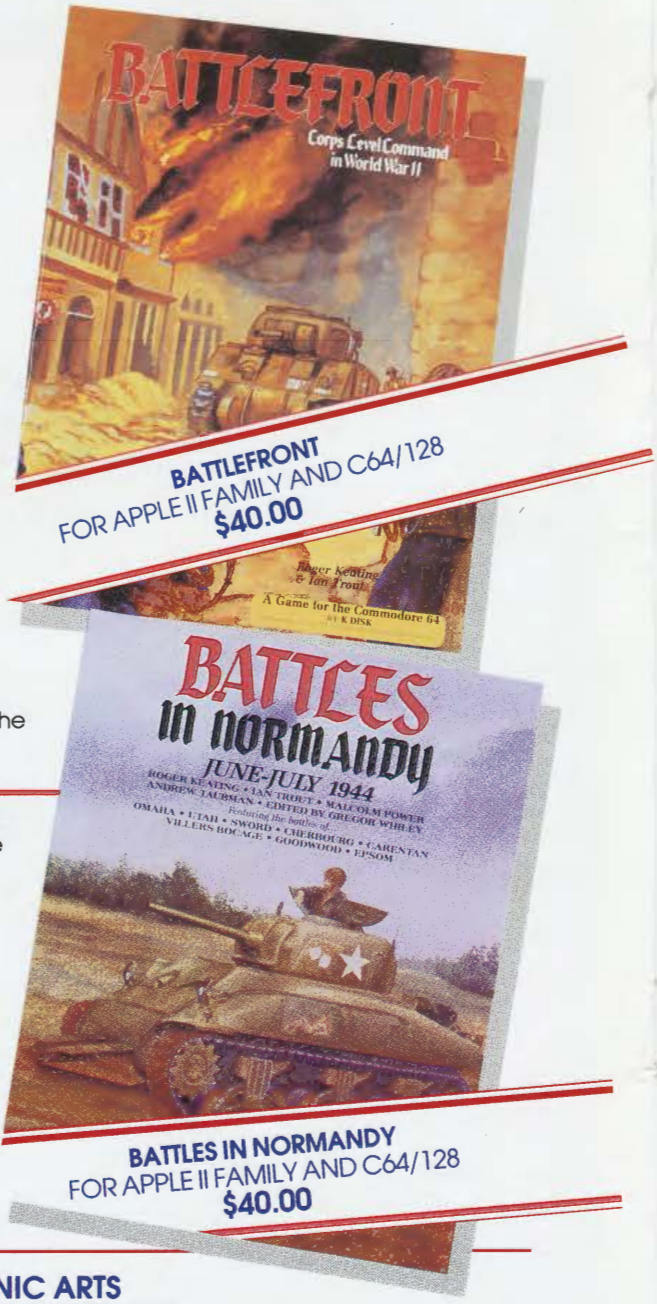
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Run 5

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July, 1987

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EDITOR'S CHANCE

As you can see from the front cover, the third edition of ***Reach for the Stars*** is just about ready. Nick Stathopoulos' has done a splendid album painting for us.

Battles In Normandy was released on June 6th, our first game ever to be finished on schedule.

It looks like we will just complete the paste-up in time to have the magazine printed before we leave for Baltimore and the **Origins '87** Game Convention.

See you there!

WORK IN PROGRESS

Reach for the Stars (3rd Edition)

We have always believed that ***Reach for the Stars*** is unique as a computer game. We are still getting letters from fans who remain strong in their praise some years after its release and ***Reach for the Stars*** remains a favourite game at SSG, despite the unimaginable number of times it has been played.

For those unfamiliar with the game, ***RFTS*** is a four player game of space conquest and colonization. As a fledgling space tyrant, you start with only one planet. Then you expand your space empire by exploration and colonization, while maintaining tight economic control of your empire. Since there are always four players in the game, (the computer runs any that are not controlled by humans), expanding empires will sooner or later collide.

This is when colonization turns to conquest as you fight for a the choicest pieces of interstellar real estate. All the while you are faced with classic economic dilemmas. Should you build more warships now or invest in the future of your economy through industry and R&D. In a four player game you can never have too many warships but in the long run a better performing economy can and will crush you. No one said space-tyranting was meant to be easy.

Now we are going to make a great product even better. The new scenario will have even more tough decisions to make. The range of your starships in unexplored space is now restricted. Paying for navigation technology will increase this range. Industrial technology can increase the effectiveness of your economy, but you have to pay for it first.

Planets can now maintain standing armies to help repel invaders, unfortunately they cost a lot to maintain. (Check with the Pentagon about that one). Even ordinary citizens cost more as their standard of living increases and they clamour for more high tech consumer toys. (Ask the Kremlin).

Standing armies make planetary conquest more difficult and all conquered planets are now more difficult to incorporate in your empire as the ungrateful population keep throwing sand in your silicon chips. Outright guerilla war is a certainty if you don't garrison them well.

With the new scenario, we have simultaneously increased the emphasis on both the military

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For those of you who don't want to spend this extra money. . . don't worry. All the data necessary to build the magazine scenarios will be provided for you.

North American subscribers should send a cheque or money order (in US funds) to our US office. Everyone else should send their cheque, money-order, Visa or Mastercard to our Australian office.

Individual scenario disks can be purchased for $15.00 each. Back issues are available for $5.00 each plus $1.00 (surface) or $4.00 (air) for postage and handling.

and economic aspects of ***RFTS***. That's got to make for a great game.

Naturally, the versions of ***RFTS*** for Mac, IBM and Amiga that we are currently working on will contain the new material as well as the original game. The Mac version will be finished first with release planned for October 1987 to coincide with the Apple and Commodore enhancements. The Apple version will run on the IIGS like all our software. However, we are planning a IIGS specific version (using the mouse and menus) for release at the same time.

The existing Apple and Commodore versions of ***RFTS*** will also get the new scenario. The rules for the new scenario will be bound into Issue 8 of ***Run 5*** and all disk subscribers will get the ***RFTS*** scenario disk appropriate to their computer. The new disk is not a stand-alone game but will require the Second Edition disk to boot. Those disk subscribers who already own ***RFTS*** will therefore get the new scenario for nothing.

All ***RFTS*** sold from then on will naturally contain the new material and will be called ***RFTS Third Edition***. People with the the new material who don't own ***RFTS Second Edition*** will be able to purchase it direct from SSG for $25.00. Those lucky people who already own ***RFTS Second Edition*** will be able to purchase an upgrade consisting of the rules and the disk for $20.00 from SSG.

The retail price for ***RFTS Third Edition*** will be $40 for all versions.

Battles of the Civil War

This project is currently getting the bulk of our design time. We have determined the major structures of the game and begun work on organizing the data base.

The system will be *grand tactical* in scope; i.e. it will simulate entire battles from the perspective of the commanding officers present.

We have selected what we think to be a very innovative approach to the use of hidden units. Each hex on the battlefield is under the control of one side or another at any given time. We will use this feature to drive the mechanism which will reveal or hide units as appropriate. When entering your orders, all friendly formations will be visible as well as those enemy units identified by the sighting routines. During resolution of the turn (i.e. run time), moving units will appear/disappear as determined by the current hex control situation.

We have done a lot of work on the graphics; the screen images will be quite different from ***Battlefront/Russia***.

The command structure will also be different from anything we have tried before. Subordination will be completely software driven so that, for example, an army commander could directly control corps, independent divisions and even independent brigades.

The distance between headquarters and the value of staff ratings will determine whether formations are in direct control or not. Formations beyond direct control will continue obeying their previous orders until the current one catches up with them. Each army commander (that's you, the player) will have access to the order menus of those subordinate formations in command range and can directly issue orders to their subordinates.

The striking feature about this system is the importance of efficient command structures. Trying to manage the Union forces directly at First Bull Run is going to be much harder than commanding them at Gettysburg.

Every formation in the game will have an arrival rating attached to it. This measures the likelihood of the unit reaching the battlefield; the value will range from certainty to highly unlikely.

We have introduced this concept to make it unnecessary to use stupid activation rules to hamstring forces at certain battles. History tells us that McClelland dropped the ball at Antietam. What's not so well known is that his hesitancy was principally due to uncertainty over the size and whereabouts of Lee's army. Our Antietam scenario will include provision for these uncertain units; it will be interesting to see just how many McClellands there are out there!

Similarly, the use of this scheme is vital to properly simulate Chancellorsville where the opposite problem wrecked the Union chances. This time Fighting Joe Hooker ignored any potential threat to his flanks and charged ahead; Stonewall Jackson rolled him up!

Rather than assign firepower rating and range values to each unit, we have provided an ordnance table for both small arms and artillery. These can be defined for each scenario and from this selection the equipment used by each brigade is determined.

We hope to release the first volume in this series (covering six Civil War battles) sometime in October. ◆

LETTERS

Dear Mr Keating and Mr Trout,

I am writing to thank you for your company's personal attention given to your customers. I entered your ***Carriers at War*** contest and received a very nice note thanking me for my entry, it was greatly appreciated and really made my day to find out my entry was well accepted even though it didn't win. I am curious to know if you plan to have another contest for ***CAW*** in the future? If not, would you still accept scenarios and pay $100 if you decided to print them in the future? I enjoy going to the library and doing research for new scenarios and wouldn't mind sending one or two in.

Well, keep up the great work, thanks for listening.

Eric Graef

Independence, MO. USA

Dear Mr Ian Trout,

Thank you for the hours of enjoyment that you have given us through ***Battlefront***. You have given our miniature addiction a new outlet on a grand scale. We own all your games (aren't we darlings) and we think you are great.

Now that the pleasantries are out of the way, down to business. We have a couple of questions. Why are the Panzer IV Ausf H's (we are assuming they are H models in 1944) in the Anzio scenario the equivalents of Panthers in rating at 12 apiece? The Panther had a 20% increase in penetration at most combat distances, had nearly twice the armour and was more agile and responsive, not to mention more feared by Allied tank crews.

On the subject of Panthers (you may have figured out by now that we have a certain attachment to them), why do Tigers earn a higher rating than Panthers? The short 88 of the Tiger had barely more killing power than the 75/48 of the IV Ausf H, and was inferior to the 'long 75' of the Panther. The increased armour of the Tiger, due to the lack of sloping, once again barely surpassed the IV Ausf H in protection (the Panther's front armour provided a 50% increase in protection over the Tiger). We are probably not telling you anything new through this information, but are curious to find out your reasoning (please don't use the 'dreaded Tiger' myth of some Allied tank crews).

We also enjoy the scenarios appearing in ***Run 5***, especially the ones for ***Europe Ablaze***. The creation routines for your games definitely ensure durable marketability. (Will there be a

way to play out the overrunning of Poland or France on the ***Russia*** system?). On the topic of scenarios, could you announce when you publish them in magazines (i.e. the Milne Bay scenario in ***Breakout***) other than ***Run 5***? This will not only introduce us to other magazines, but let us keep up with what is available for our games.

L. Veres, S. Voista (If we got the signatures right)

Colarado. USA

Dear Ian and Roger,

I have recently had the opportunity to play ***Russia***, and wish to congratulate you both on yet another fine game; to my mind, your best to date. The care and attention taken over the whole package just shines through and is in contrast to most of the opposition, who charge a fortune for their games and, more often than not, deliver a lack-lustre product in a box containing mostly thin air. Enough of the bouquets, now for the brick-bat! The one thing missing from the game is a strategic map facility; i.e. something that lets you zoom-out to view the map on at least one, and preferably two, different scales. I know that this must eat up the memory, but perhaps you'll find some room for it when designing your next game.

In the last issue of ***Run 5***, several of your readers wrote in with game requests, here's mine to add to the list. Something along the line of ***Battlefront*** allowing you to represent different Napoleonic battles at the operational level; the possibilities for scenarios and variants are almost endless. I think that this would be a sure winner, especially as the computer game market is saturated with WWII and modern titles. I note that you have mooted a tactical game system for the 1700-1860 era, you have my vote for that too. Finally, have you any plans for IBM conversions? Preferably with EGA facility. . . now I know *that's* a minority preference.

Andrzej J. J. Cierpicki

New Territories, HONG KONG

Dear Sir,

Congratulations on Russia. It is excellent as usual, you must get sick of people telling you what a great job you do! (*No No No. . . we*

Continued on p.48

MORE QUESTIONS (More Answers. . .)

Q. What factors affect combat in *Europe Ablaze*?

A. Offensive Combat - Max speed, manoeuvrability, firepower, climb rate, type (single engined, twin engined etc) and role (fighter, bomber etc).

Defensive Combat - Max speed, manoeuvrability, vulnerability, climb rate, type and role.

The above factors are combined to produce a plane factor which is used by the combat routines along with crew factors (fatigue, experience) and weather to produce final results.

All the plane factors work on a differential basis and the maximum speed differential is by far the most important of these (i.e. produces the greatest effect on the combat routines).

Q. In *CAW* I sometimes have problems vectoring fast task groups onto convoys. They seem to overshoot. What can I do about it?

A. There are problems with vectoring task groups with a large speed advantage onto slower moving groups. These are intrinsic to the movement system and cannot really be avoided. The solution is to get as close as possible to the target group and then reduce speed to only 5-10 knots greater than your opponent. This can be thought of as representing the carrying out of efficient search procedures.

Q. Since almost all US capital ships carried float planes, why are these not represented in any *CAW* scenario?

A. Almost all US Battleships and Cruisers did carry float planes. However, they were used as scout planes rather than search planes. They did not have a large range and they were employed for local reconnaissance, message transfers and so on. There was no doctrine for employing them as part of an integrated, long range search effort in conjunction with carrier based planes. The pilots were not trained for this and essentially they were not employed in this fashion. Similar reasoning applies to the Commonwealth ships. If these float planes were left in they would contribute unfairly to the search capabilities of their task forces.

Q. Why are all the submarines in the Midway scenario concentrated at the top of the map?

A. Actually, they are correctly deployed on the map in their proper and historical locations. Its just that there wasn't the memory left for a routine to report them. If you wan't to change the locations go ahead, but you'll have to write down the locations as you put them in, as you can't determine them once you have done it.

MEA CULPA

Carriers at War. Ken Wastrack who designed the Leyte Gulf scenario has been kind enough to inform us that there were some errors in the task force objectives. The corrected objectives are - Jap TGs 1 and 2 (16 *Morotai*), Jap TGs 3 and 4 (17 *Tucloban*), Jap TGs 5 and 6 (18 *Dulag*) and Allied TGs 1 and 8-13 (17 *Tucloban*). Another minor error is Japanese Ship Class #20. Change the torpedo tube value from 0 to 12.

Battlefront. In the Crete scenario for *Battlefront*, hex (20,3) is shown on the map as ocean and on the disk as clear. The disk scenario should be altered to fit the map if this is a problem.

In the Arnhem scenario the northern hexside of (24,16) should be made into a bridge. This is essential if the XXX Corps variant is used. There are also a number of other small discrepancies between the disk and the magazine, mainly to do with equipment names, none of which affect the play of the scenario

In the Task Force South scenario, the 2nd Divisional Asset of the 1st Division for the Argentines is listed in the magazine as attached at the start of the game to regiment 4. On the disk its attachment is 0, thus it never turns up for the battle at all. While this is not completely ahistorical, the Argies need all the help they can get, so change the attachment on the disk to read 4.

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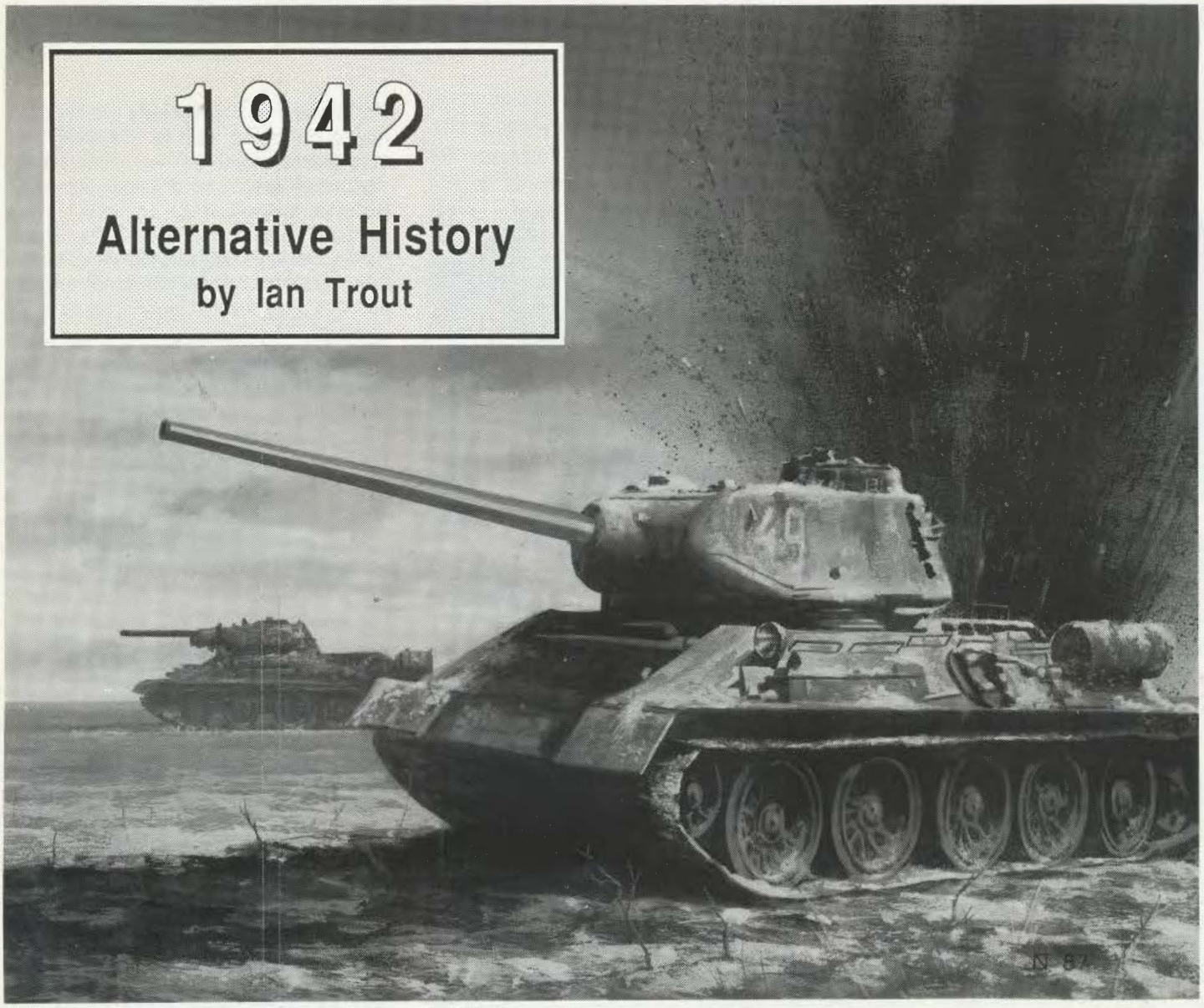
1942

Alternative History

by Ian Trout



Of all the campaigns of the Second World War, it is the gigantic struggle on the Eastern Front which holds the greatest interest. The Wehrmacht's guiding principle in the inter-war years was to avoid a two-front war. Somehow this vital precaution was forgotten in the euphoria surrounding the unexpectedly easy conquest of France.

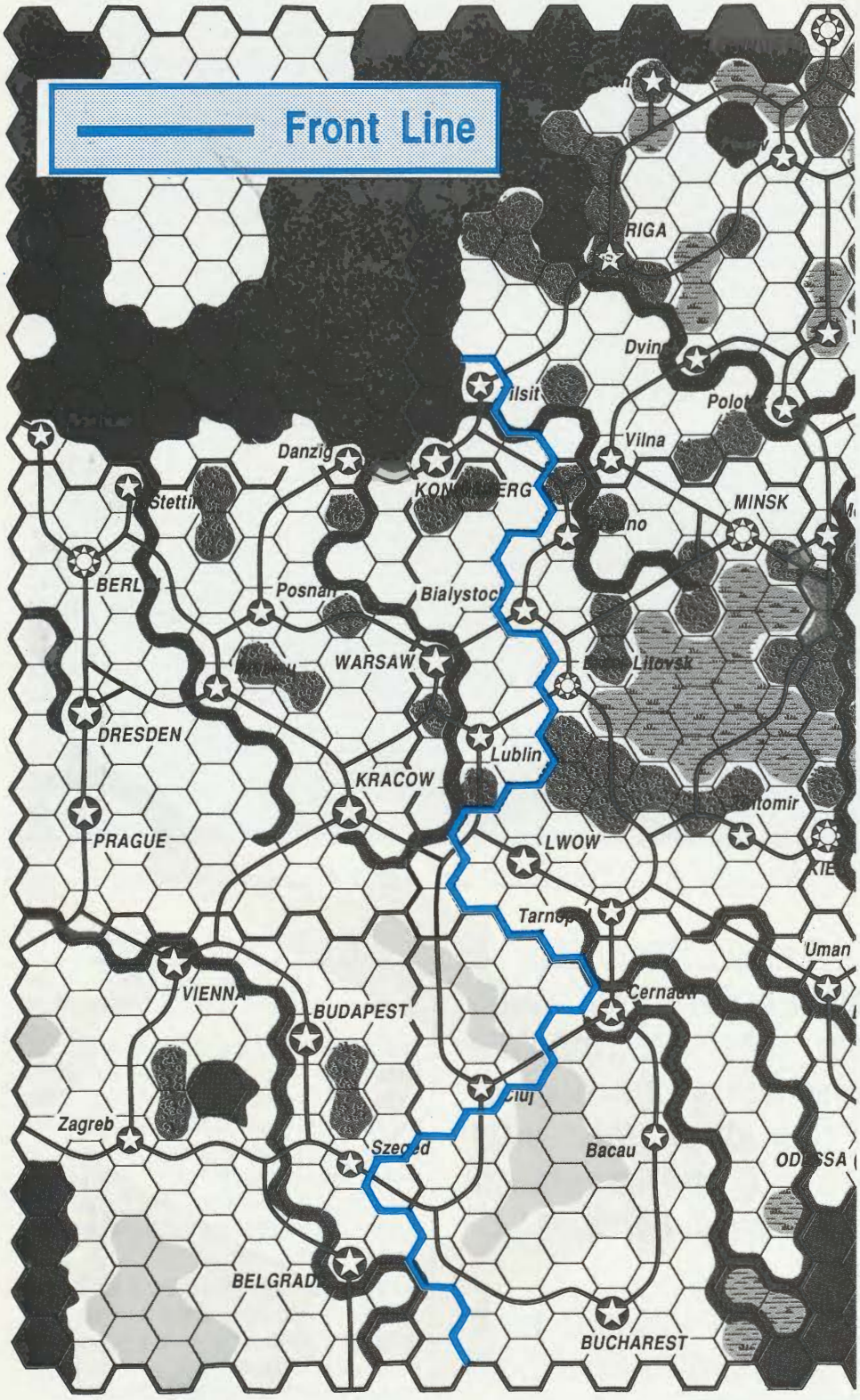
In this hypothetical campaign, we will examine what could have happened had Germany waited until Britain had been crushed before invading Russia.

ALTERNATIVE HISTORY

The ***1942*** campaign begins in May. The British Isles were conquered by the end of 1941 and German/Italian control of North Africa extends from Tunisia to Syria. The exiled British government directs its remaining forces from Canada. (You can, in fact, take part in this invasion of England; the Sealion 1941 scenario simulates the opening days of the campaign.)

No effective Allied opposition is in range of Western Europe. American help will take time to prepare; 1946 is the earliest they can be expected to intervene. They will, however, be able to provide additional lend-lease for the Russians once hostilities commence.

1942 - Map Changes



The Russians have not been idle in the interim. Having acquired a taste for Rumanian soil from their appropriation of Bessarabia in 1940, they take their ambition one step further and gobble up the rest of the country in the summer of 1941. The Rumanian military system is completely dismantled and little assistance can be expected from this direction once the invasion of Russia gets underway.

By way of compensation, however, the Wehrmacht has a one front war. The garrison requirements for other theatres is substantially reduced and little provision need be made for the defense of German industry from Allied strategic bombing.

This is the basic situation as the Germans gear up for the invasion of Russia. Would it have been enough to make any difference to the historical outcome?

CREATING THE CAMPAIGN

Rather than list all of the changes and features of this campaign in a descriptive fashion, it is more convenient to present them in the order of the Design Routines.

Save the historical campaign game into a spare location as described on page 50 of the ***Russia*** Player's Manual and then make the following modifications to it.

5.11 Map Size. No change.

5.12 Map Edit Utility. The front line has changed in the southern part of the map. Make the indicated changes to hex control.

The Russians have had time to convert most rail-lines to broad gauge. Convert all Axis rail hexes east of the front line to Soviet rail hexes except for the rail lines leading from Bucharest to Cluj and Szeged. (Bucharest is a Soviet rail hex).

5.21 City Creation. Seven cities have had changes made to their specifications. Use the tabulated data provided to make the necessary changes.

5.22 Region Creation. Add 1 to the lend-lease value of regions 1-5.

5.23 Troop Creation. There is a complete reorganization of the military formations. The initial invasion forces are deployed along the lines of the historical model, except in the south where the Hungarians now cover the extended Soviet border. Use the tabulated data provided to create the new troops.

Note that many of the Russian Armies begin the game in a fortified state.

5.24 Supply Allowance. No change.

5.25 Division Types. Alter the values as follows. Axis Pz XX (0-5, 2-7, 14-8); Axis PzG XX (0-5, 12-6, 27-7); Axis Inf XX (0-4, 22-3, 38-2); Soviet Tank XXX (0-4, 4-6, 20-7); Soviet Mech XXX (0-5, 16-7, 25-9), Soviet Rifle XX (0-3, 17-4, 33-3). For example, the time values for German Infantry XXs are 0, 22 and 38 while the corresponding combat values are 4, 3 and 2.

5.31 Scenario Details. No change.

5.32 Length Details. Week (3), month (5), year (42), invasion (1), first winter (0), length (50), Axis min VP (23), Soviet min VP (20), D Day (0) effect (0), Salerno (30) and effect (2).

5.33 Axis Briefing. These are essentially the same as the historical model except that they do not deteriorate so badly in the last years. See tabulated data provided.

5.34 Soviet Briefing. The Soviets begin the game with improved values to represent the benefit of an extra year of reorganization. See tabulated data provided.

5.4 Reinforcements. The reinforcement tracks for both sides are, of course, a subjective evaluation. If anything, they are an under-estimate. A 10-15% increase across the board would not take the OBs outside the bounds of probability. See the tabulated data provided.

PLAYING THE CAMPAIGN

Germany begins the game with the same advantage enjoyed in the historical campaign. I struggled for some before deciding to place the Russians under a *surprised* handicap. The deciding factor was that they were so completely surprised in 1941, when even elementary intelligence must have indicated an impending German attack.

The major component in the Russian collapse was not so much that they were unaware of German intentions but that they were so ill-prepared to fight a modern war against a mobile, aggressive opponent. The Russians certainly had the tools to repel the invaders. They did not have the doctrine, experience or (to a lesser extent) the leadership to put them to proper use.

There is no reason that I am aware of to think that this situation would have changed much

1942 - Army Groups/Theatres

ARMY GRP #	1-3	1	2	3
ARMY GRP ID	[9]	AG North	AG Centre	AG South
SUPPLY	0-7	7	7	7
ADMIN	0-7	7	7	7
AIR	0-63	24	41	27
GROUND	0-63	28	55	46
BASED AT	0-76	15	16	12
ARM. XXs	0-7	0	1	1
MOT. XXs	0-7	0	1	0
INF. XXs	0-7	3	4	3

THEATRE #	5-7	5	6	7
THEATRE ID	[9]	Theatre A	Theatre B	Theatre C
SUPPLY	0-7	6	6	4
ADMIN	0-7	4	4	3
AIR	0-63	20	45	33
GROUND	0-63	27	60	44
BASED AT	0-76	37	60	62
ARM. XXs	0-7	2	4	1
MOT. XXs	0-7	1	2	1
INF. XXs	0-7	4	7	5

1942 - Axis Armees

ARMEE NUMBER	1-18	1	2	3	4	5	6	7
ARMEE ID	[9]	1Pz Armee	9 Armee	10 Armee	2Pz Armee	3Pz Armee	11 Armee	12 Armee
ARMEE TYPE	0-3	0	0	0	0	0	0	0
SUPPLY	0-7	7	7	7	7	7	7	7
ADMIN	0-7	7	7	7	7	7	7	7
ARRIVAL	0-60	0	0	0	0	0	0	0
BASED AT	0-76	15	17	15	16	16	18	16
ARMY GROUP	0/1-3	1	1	1	2	2	2	2
ARMOURED XXs	0-7	0	0	0	1	1	0	0
MOTORIZED XXs	0-7	0	0	0	0	1	0	0
INFANTRY XXs	0-7	1	1	2	1	1	2	2

ARMEE NUMBER	1-18	8	9	10	11	12	13	14
ARMEE ID	[9]	4Pz Armee	13 Armee	14 Armee	1 Hu Army	8 It Army	5Pz Armee	15 Armee
ARMEE TYPE	0-3	0	0	0	2	3	0	0
SUPPLY	0-7	7	7	7	7	7	0	0
ADMIN	0-7	7	7	7	7	7	0	0
ARRIVAL	0-60	0	0	0	0	2	10	10
BASED AT	0-76	12	12	10	10	10	0	0
ARMY GROUP	0/1-3	3	3	3	3	3	0	0
ARMOURED XXs	0-7	1	0	0	1	1	0	0
MOTORIZED XXs	0-7	1	0	0	0	0	0	0
INFANTRY XXs	0-7	2	3	1	6	3	0	0

1942 - Soviet Fronts

FRONT NUMBER	19-31	19	20	21	22	23	24	25
FRONT ID	[9]	Leningrad	Baltic	Western	Moscow	Rumanian	Kiev	Odessa
FRONT TYPE	0-3	0	0	0	0	0	0	0
SUPPLY	0-7	5	5	5	5	5	5	5
ADMIN	0-7	4	4	4	4	4	4	4
ARRIVAL	0-60	0	0	0	0	0	0	0
BASED AT	0-76	37	25	22	60	31	21	28
THEATRE	0/5-7	5	5	6	6	7	7	7
ARMOURED XXs	0-7	1	1	1	4	0	2	2
MOTORIZED XXs	0-7	0	1	0	3	0	2	0
INFANTRY XXs	0-7	2	3	5	7	3	4	4

FRONT NUMBER	19-31	26	27	28	29	30	31	
FRONT ID	[9]	Caucasus	South	Don	Voronezh	Southwest	Staling'd	
FRONT TYPE	0-3	0	0	0	0	0	0	
SUPPLY	0-7	0	0	0	0	0	0	
ADMIN	0-7	0	0	0	0	0	0	
ARRIVAL	0-60	2	3	7	12	16	20	
BASED AT	0-76	0	0	0	0	0	0	
THEATRE	0/5-7	0	0	0	0	0	0	
ARMOURED XXs	0-7	0	0	0	0	0	0	
MOTORIZED XXs	0-7	0	0	0	0	0	0	
INFANTRY XXs	0-7	0	0	0	0	0	0	

1942 - Axis Korps

KORPS NUMBER	1-40	1	2	3	4	5	6	7	8	9	10
KORPS ID	[3]	46	56	10	8	12	20	9	28	35	41
FORT. LEVEL	0-3	0	0	0	0	0	0	0	0	0	0
KORPS TYPE	0-7	2	2	1	1	1	1	1	1	1	2
SUPPLY	0-7	7	7	7	7	7	7	7	7	7	7
ADMIN	0-7	7	7	7	7	7	7	7	7	7	7
EXPERIENCE	0-7	7	7	5	6	5	5	7	6	6	7
FATIGUE	0-7	7	7	7	7	7	7	7	7	7	7
LOSSES	0-7	0	0	0	0	0	0	0	0	0	0
ARMEE	0/1-18	1	1	1	2	2	2	3	3	3	4
ARRIVAL	0-60	0	0	2	0	0	0	0	2	2	0
MAP LOCATION	(x,y)	11,8	11,9	9,8	10,7	10,8	10,9	9,8	9,8	9,8	10,10
ARMOURED XXs	0-7	2	1	0	0	0	0	0	0	0	2
MOTORIZED XXs	0-7	1	2	0	0	0	0	0	0	0	1
INFANTRY XXs	0-7	0	0	2	3	3	3	3	2	3	0

KORPS NUMBER	1-40	11	12	13	14	15	16	17	18	19	20
KORPS ID	[3]	57	2	14	39	34	17	27	50	1	11
FORT. LEVEL	0-3	0	0	0	0	0	0	0	0	0	0
KORPS TYPE	0-7	2	1	2	2	1	1	1	1	1	1
SUPPLY	0-7	7	7	7	7	7	7	7	7	7	7
ADMIN	0-7	7	7	7	7	7	7	7	7	7	7
EXPERIENCE	0-7	6	5	7	6	5	4	5	5	6	5
FATIGUE	0-7	7	7	7	7	7	7	7	7	7	7
LOSSES	0-7	0	0	0	0	0	0	0	0	0	0
ARMEE	0/1-18	4	4	5	5	5	6	6	6	7	7
ARRIVAL	0-60	0	0	0	0	0	0	0	0	0	2
MAP LOCATION	(x,y)	10,11	9,10	10,12	11,12	10,13	11,13	11,14	10,14	9,12	9,12
ARMOURED XXs	0-7	3	0	2	3	0	0	0	0	0	0
MOTORIZED XXs	0-7	1	0	2	1	0	0	0	0	0	0
INFANTRY XXs	0-7	0	2	0	0	2	3	3	3	3	3

KORPS NUMBER	1-40	21	22	23	24	25	26	27	28	29	30
KORPS ID	[3]	54	3	24	7	4	30	42	26	6	49
FORT. LEVEL	0-3	0	0	0	0	0	0	0	0	0	0
KORPS TYPE	0-7	1	2	2	1	1	1	5	1	1	5
SUPPLY	0-7	7	7	7	7	7	7	7	7	7	7
ADMIN	0-7	7	7	7	7	7	7	7	7	7	7
EXPERIENCE	0-7	4	6	6	4	5	5	7	6	4	6
FATIGUE	0-7	7	7	7	7	7	7	7	7	7	7
LOSSES	0-7	0	0	0	0	0	0	0	0	0	0
ARMEE	0/1-18	7	8	8	8	9	9	9	10	10	10
ARRIVAL	0-60	2	0	0	0	0	0	0	0	2	2
MAP LOCATION	(x,y)	9,12	9,15	9,16	10,15	9,17	10,18	9,18	6,20	6,20	6,20
ARMOURED XXs	0-7	0	1	3	0	0	0	0	0	0	0
MOTORIZED XXs	0-7	0	2	1	0	0	0	0	0	0	0
INFANTRY XXs	0-7	3	0	0	2	3	3	4	3	3	3

KORPS NUMBER	1-40	31	32	33	34	35	36	37	38	39	40
KORPS ID	[3]	1Hu	2Hu	3Hu	4Hu	1It	2It	1SS	2SS	3SS	4SS
FORT. LEVEL	0-3	2	2	2	2	0	0	0	0	0	0
KORPS TYPE	0-7	6	6	6	6	6	6	4	4	4	3
SUPPLY	0-7	6	6	6	6	7	7	0	0	0	0
ADMIN	0-7	6	6	6	6	7	7	0	0	0	0
EXPERIENCE	0-7	5	4	3	3	4	3	0	0	0	0
FATIGUE	0-7	7	7	7	7	7	7	0	0	0	0
LOSSES	0-7	0	0	0	0	0	0	0	0	0	0
ARMEE	0/1-18	11	11	11	11	12	12	0	0	0	0
ARRIVAL	0-60	0	0	0	0	3	3	8	11	16	16
MAP LOCATION	(x,y)	7,22	8,22	9,21	10,21	6,20	6,20	0	0	0	0
ARMOURED XXs	0-7	1	1	0	0	2	0	0	0	0	0
MOTORIZED XXs	0-7	0	0	0	0	0	0	0	0	0	0
INFANTRY XXs	0-7	4	4	4	3	4	4	0	0	0	0

1942 - Axis Reinfs

TURN	ASP 0-31	GSP 0-31	ARM 0-7	MOT 0-7	INF 0-150	MR 0-15	IR 0-15
5/42	2	5	-	-	3	1	2
6/42	5	5	-	-	8	1	2
7/42	8	9	-	-	5	1	-
8/42	3	6	-	1	5	1	-
9/42	4	4	-	1	3	1	-
10/42	4	7	-	1	-	1	2
11/42	4	5	-	1	-	1	2
12/42	4	5	-	-	3	1	4
1/43	4	6	-	-	5	2	4
2/43	3	4	1	-	5	2	4
3/43	3	8	1	1	7	2	3
4/43	3	5	-	-	6	2	3
5/43	4	5	1	1	4	2	3
6/43	4	3	-	-	3	2	3
7/43	4	3	-	-	-	2	2
8/43	5	6	-	-	-	2	2
9/43	5	7	-	-	1	2	2
10/43	5	7	-	-	4	2	3
11/43	5	9	1	-	6	2	3
12/43	5	9	-	-	6	2	3
1/44	6	10	-	1	3	2	3
2/44	6	10	1	1	3	2	4
3/44	6	8	1	1	4	3	4
4/44	6	8	2	1	2	3	4
5/44	6	8	2	2	6	3	3
6/44	6	8	3	2	3	3	3
7/44	5	7	2	1	4	3	3
8/44	5	7	1	-	2	2	3
9/44	5	7	-	-	2	2	3
10/44	5	7	-	-	-	2	2
11/44	5	6	-	-	-	2	2
12/44	5	6	-	-	3	2	2
1/45	6	7	-	-	3	2	2
2/45	6	10	-	-	1	3	2
3/45	6	10	-	-	1	3	2
4/45	6	12	2	-	1	3	3
5/45	6	13	2	-	4	3	3
6/45	6	15	2	-	5	3	4
7/45	8	15	-	-	11	3	4
8/45	8	11	-	-	8	3	4
9/45	8	11	-	-	3	3	4
10/45	7	8	-	-	3	3	3
11/45	7	8	-	-	7	3	3
12/45	6	8	-	-	2	2	2
1/46	6	8	-	-	2	2	2
2/46	6	8	1	-	3	2	2
3/46	6	8	1	-	4	2	2
4/46	6	8	1	-	2	2	2
5/46	6	8	-	-	1	2	2
6/46	6	8	-	-	1	2	2

had the Russians enjoyed an extra year of preparation.

The first few weeks will go well for Germany, save only that losses will be a little higher because of the fortifications which follow the northern part of the front line and the better quality of Russian infantry divisions.

The drives to Leningrad and Smolensk will go much as usual. The extra three weeks of

1942 - Soviet Reinfs

TURN	ASP 0-31	GSP 0-31	ARM 0-7'	MOT 0-7	INF 0-150	MR 0-15	IR 0-15
5/42	-	-	-	-	7	-	-
6/42	12	9	-	-	28	-	-
7/42	12	14	2	-	35	-	-
8/42	8	20	2	-	30	-	-
9/42	4	22	-	-	22	-	-
10/42	7	13	4	-	15	-	-
11/42	7	13	-	-	12	-	-
12/42	6	15	-	-	12	-	1
1/43	8	16	-	-	8	1	1
2/43	6	16	2	-	6	1	3
3/43	9	10	3	-	6	1	3
4/43	9	9	3	1	13	1	3
5/43	9	15	3	-	9	1	3
6/43	9	12	3	-	7	1	3
7/43	9	11	1	-	8	1	3
8/43	8	11	-	-	8	1	3
9/43	8	11	-	-	11	1	3
10/43	8	11	-	-	13	1	3
11/43	8	11	-	1	10	1	4
12/43	6	11	2	-	10	2	4
1/44	6	11	1	1	7	2	4
2/44	6	11	-	-	9	2	4
3/44	6	12	-	-	8	2	4
4/44	6	12	3	1	7	2	4
5/44	6	13	2	3	6	2	4
6/44	6	13	4	1	12	2	4
7/44	7	13	2	-	4	3	4
8/44	7	14	-	-	5	3	4
9/44	7	14	-	-	8	3	3
10/44	7	14	-	-	-	3	3
11/44	7	14	-	-	9	3	3
12/44	7	14	1	-	3	3	3
1/45	8	10	1	1	3	3	3
2/45	8	10	-	-	1	3	3
3/45	8	10	-	-	5	3	3
4/45	8	10	1	-	1	3	3
5/45	8	10	2	-	4	3	3
6/45	8	10	-	-	5	3	2
7/45	8	10	-	-	4	3	2
8/45	8	10	-	-	6	3	2
9/45	9	7	2	1	3	3	2
10/45	9	7	-	1	4	3	2
11/45	9	7	-	-	7	3	2
12/45	7	7	-	-	2	3	2
1/46	7	7	1	-	5	3	2
2/46	7	7	2	-	3	3	2
3/46	7	7	-	1	4	3	2
4/46	7	7	-	1	3	3	2
5/46	7	7	-	-	3	3	2
6/46	7	7	-	-	3	3	2

summer campaigning compensates for the stronger Russians.

Things are tougher in the south. There are no Rumanian forces and the front line is up to 6 hexes further west.

A reinforced Hungarian army guards the new frontier while a German Armee is en route to Budapest and should be deployed by the end of June. The mountains provide good

1942 - Soviet Armies

ARMY NUMBER	41-94	41	42	43	44	45	46	47	48	49	50
ARMY ID	[3]	5	19	27	7	8	13	26	3	9	21
FORT. LEVEL	0-3	0	0	0	2	2	0	2	2	2	2
ARMY TYPE	0-7	1	1	1	1	1	1	1	1	1	1
SUPPLY	0-7	5	5	5	5	5	5	5	5	5	5
ADMIN	0-7	5	5	5	5	5	5	5	5	5	5
EXPERIENCE	0-7	3	4	2	5	4	4	2	4	4	3
FATIGUE	0-7	7	7	7	7	7	7	7	7	7	7
LOSSES	0-7	0	0	0	0	0	0	0	0	0	0
FRONT	0/19-31	19	19	19	20	20	20	20	21	21	21
ARRIVAL	0-60	0	0	2	0	0	0	0	0	0	0
MAP LOCATION	(x,y)	18,0	17,2	18,0	11,6	11,7	13,4	12,8	12,9	11,10	12,12
ARMOURED XXs	0-7	1	0	0	1	0	1	0	0	0	1
MOTORIZED XXs	0-7	1	0	0	0	0	1	0	0	0	0
INFANTRY XXs	0-7	4	4	3	3	4	3	4	3	4	4

ARMY NUMBER	41-94	51	52	53	54	55	56	57	58	59	60
ARMY ID	[3]	23	6	1	6	16	22	1	2	3	4
FORT. LEVEL	0-3	(3)	2	2	0	0	0	0	0	0	0
ARMY TYPE	0-7	1	2	3	1	1	1	7	7	7	1
SUPPLY	0-7	5	5	5	5	5	5	7	7	7	3
ADMIN	0-7	5	5	5	5	5	5	7	7	7	3
EXPERIENCE	0-7	2	4	5	4	2	2	7	7	6	4
FATIGUE	0-7	7	7	7	7	7	7	7	7	7	7
LOSSES	0-7	0	0	0	0	0	0	0	0	0	0
FRONT	0/19-31	21	21	21	22	22	22	22	22	22	23
ARRIVAL	0-60	0	0	0	0	0	0	5	6	6	0
MAP LOCATION	(x,y)	12,13	11,11	12,10	22,8	25,6	25,9	25,6	25,6	25,6	10,22
ARMOURED XXs	0-7	0	1	3	0	0	0	0	0	0	0
MOTORIZED XXs	0-7	0	0	2	0	0	0	0	0	0	0
INFANTRY XXs	0-7	5	3	1	4	4	4	6	6	6	3

ARMY NUMBER	41-94	61	62	63	64	65	66	67	68	69	70
ARMY ID	[3]	10	32	12	2	11	12	18	4	14	33
FORT. LEVEL	0-3	0	0	0	0	2	2	2	2	0	0
ARMY TYPE	0-7	1	1	4	3	1	1	1	2	1	1
SUPPLY	0-7	3	3	3	3	5	5	5	5	5	5
ADMIN	0-7	3	3	3	3	5	5	5	5	5	5
EXPERIENCE	0-7	4	2	5	3	3	3	3	3	2	3
FATIGUE	0-7	7	7	7	7	7	7	7	7	7	7
LOSSES	0-7	0	0	0	0	0	0	0	0	0	0
FRONT	0/19-31	23	23	23	23	24	24	24	24	25	25
ARRIVAL	0-60	0	0	0	0	0	0	0	0	0	0
MAP LOCATION	(x,y)	9,22	9,23	9,24	13,25	10,17	11,15	10,16	12,15	12,18	12,20
ARMOURED XXs	0-7	0	0	0	2	1	0	1	0	0	0
MOTORIZED XXs	0-7	0	0	0	1	0	0	0	0	0	0
INFANTRY XXs	0-7	3	4	4	1	3	4	4	4	3	3

ARMY NUMBER	41-94	71	72	73	74	75	76	77	78	79	80
ARMY ID	[3]	34	1	2	3	4	5	6	7	8	9
FORT. LEVEL	0-3	0	0	0	0	0	0	0	0	0	0
ARMY TYPE	0-7	1	5	5	5	5	5	5	5	5	5
SUPPLY	0-7	5	0	0	0	0	0	0	0	0	0
ADMIN	0-7	5	0	0	0	0	0	0	0	0	0
EXPERIENCE	0-7	3	0	0	0	0	0	0	0	0	0
FATIGUE	0-7	7	0	0	0	0	0	0	0	0	0
LOSSES	0-7	0	0	0	0	0	0	0	0	0	0
FRONT	0/19-31	25	0	0	0	0	0	0	0	0	0
ARRIVAL	0-60	0	2	5	6	6	7	7	12	18	25
MAP LOCATION	(x,y)	13,19	0	0	0	0	0	0	0	0	0
ARMOURED XXs	0-7	0	0	0	0	0	0	0	0	0	0
MOTORIZED XXs	0-7	0	0	0	0	0	0	0	0	0	0
INFANTRY XXs	0-7	4	0	0	0	0	0	0	0	0	0

1942 - Soviet Armies (Cont.)

ARMY NUMBER	41-94	81	82	83	84	85	86	87	88	89	90
ARMY ID	[3]	10	3	4	5	7	8	15	1	2	3
FORT. LEVEL	0-3	0	0	0	0	0	0	0	0	0	0
ARMY TYPE	0-7	5	3	3	3	2	2	4	6	6	6
SUPPLY	0-7	0	0	0	0	0	0	0	0	0	0
ADMIN	0-7	0	0	0	0	0	0	0	0	0	0
EXPERIENCE	0-7	0	0	0	0	0	0	0	0	0	0
FATIGUE	0-7	0	0	0	0	0	0	0	0	0	0
LOSSES	0-7	0	0	0	0	0	0	0	0	0	0
FRONT	0/19-31	0	0	0	0	0	0	0	0	0	0
ARRIVAL	0-60	32	6	12	14	3	5	7	14	17	28
MAP LOCATION	(x,y)	0	0	0	0	0	0	0	0	0	0
ARMOURED XXs	0-7	0	0	0	0	0	0	0	0	0	0
MOTORIZED XXs	0-7	0	0	0	0	0	0	0	0	0	0
INFANTRY XXs	0-7	0	0	0	0	0	0	0	0	0	0

1942 - Cities

CITY NUMBER	FIXED	10	13	19	28	68	75	76
CITY NAME	FIXED	Budapest	Szeged	Cluj	Cernauti	Vologda	Kazan	Saratov
MAP LOCATION	FIXED	6,20	7,22	10,21	13,19	28,0	35,4	35,11
VICTORY PTS	0-7	6	2	2	3	1	1	1
COUNTRY	0-7	1	1	1	2	7	7	7
ARMY GROUP	1-3	3	3	3	3	1	2	2
THEATRE	1-3	3	3	3	3	1	2	2
MAJOR CITY	0-1	1	0	0	0	0	0	1
CAPITAL	0-1	1	0	0	0	0	0	0
FORTRESS	0-1	0	0	0	0	0	0	0
AXIS SUPPLY	0-1	0	0	0	0	0	0	0
SOVIET SUPPLY	0-1	0	0	0	0	1	1	1

1942 - Axis Briefing

YEAR	39-50	1942	1943	1944	1945	1946		
ASP VALUE	0-7	5	5	5	4	4		
GSP VALUE	0-7	5	5	4	4	4		
KORPS LEADER.	0-7	6	5	5	4	4		
ARMEE LEADER.	0-7	5	4	4	4	4		
OKH ADMIN	0-7	6	5	5	4	4		
OKH SUPPLY	0-7	5	5	5	4	4		
RUMANIAN	0-7	-	-	-	-	-		
HUNGARIAN	0-7	3	4	3	1	-		
ITALIAN	0-7	2	3	2	-	-		
OKW ARM. XXs	0-63	2	2	2	3	7		
OKW MOT. XXs	0-63	1	1	1	2	2		
OKW INF. XXs	0-63	10	10	13	18	20		
OKW ASPs	0-63	12	14	18	22	25		
OKW GSPs	0-63	10	10	15	18	20		

1942 - Soviet Briefing

YEAR	39-50	1942	1943	1944	1945	1946		
ASP VALUE	0-7	3	4	4	4	4		
GSP VALUE	0-7	4	4	5	5	5		
ARMY LEADER.	0-7	4	4	5	5	5		
FRONT LEADER.	0-7	3	4	4	5	5		
STAVKA ADMIN	0-7	4	4	4	5	5		
STAVKA SUPPLY	0-7	4	4	5	5	5		
SECOND FRONT	0-7	-	-	1	1	3		
PARTISANS	0-7	-	1	3	3	2		

defensive terrain and the best policy is to let the Russians withdraw; there is always a chance that a vigorous drive from Lwow to Uman could trap the retreating Soviets.

What can the Russians do for the first two months? Skilful retreat is called for. The rugged terrain between Pskov and Leningrad is ideal for defense; similarly, it's dangerous to let the Germans advance much past Smolensk without a good fight. Remember that the Wehrmacht is not going to suffer a first winter penalty. They will be much less vulnerable to counter-attack. Use the bad weather to dig in everywhere.

The issue should be decided in the summer of 1943.

CAMPAIGN VARIATIONS

1. Surprise. The most obvious possibility is to remove the surprise handicap from the Russians. If this is done, there is a real chance that the Germans can be held at the border for several weeks.

2. First Winter. The first winter penalty can be introduced for the Germans. I chose to remove it primarily because the winter of 1942 was remarkably mild while the previous winter was a nightmare. The Germans were not to have known this, of course, so that some sort of penalty may be justified for their inadequate preparation.

3. Faster Soviet Mobilization. Add 6 infantry divisions to the Soviet reinforcement track for the months August 1942 to February 1943. To compensate, reduce infantry replacements by 1 for all of 1942-1944.

4. German Infantry Divisions. Assume that the decline in the quality of German infantry divisions was halted. Change the combat value of all German infantry divisions to 4. The cost of this change is that infantry replacements from June 1943 until the end of the war must be reduced by 1 per month.

5. American Armour. Assume that America provided a massive increase in tanks, trucks and other armoured vehicles. Increase the lend lease values of regions 4 and 5 to 7 and add 2 tank corps and 1 mech corps to the Russian OB in Oct 1943, Feb and July 1944 and Jan 1945.

6. Increased Partisan Activity. The level of Partisan activity is fairly low; purely the prejuJice of the designer against terrorist operations. It may well be more accurate to add 1 to the Partisan value for 1943-1946.

PROGRAMMING AND GAME DESIGN

Structuring a Database

by Roger Keating and his Computer

The development of an accessable database is one of the most important aspects of game design, as well as one of the first things that has to be done. This article will give you some idea of how we go about doing it.

INTRODUCTION

Since Issue 5 I have been working assiduously on a magnificent piece of software. It will be titled the **Automatic Software Writer**, or ASW for short, and will be able to translate 6502 code into English as well as having the dual purpose of documenting my programs. Thus, in a single step I will be able to keep both Ian Trout and Gregor Whiley happy as well as being able to sell this program to almost all known programmers. (From the number of letters I have received I feel that the demand for this product will outsell any of our games).

Unfortunately, this product is slightly behind schedule, a state which is not uncommon among game producers, and I will have to lean again on my friend John Smith who manages to reword some of the copy so that sentences more or less make sense and he even throws in a few verbs and adjectives to make it readable. (He had nothing to do with the previous sentence. J.S.)

The first thing to do in designing any computer game is to decide on the scope and scale of the map display and the units that will make up the orders of battle. The second step is to develop the database. The first part of this process is to put the map into the database. I described how to do this in Issue 5. In the ***Battlefront*** database there are eight sections, the first of which is the map. In this article I will describe the remaining sections and show how the structure of the units can be stored in it.

THE *BATTLEFRONT* DATABASE

Assume that the numbers used in this article are decimal unless preceded by a dollar sign in which case they are hexadecimal (e.g. 100 = $64). The word 'page' indicates 256 ($100) bytes in memory. When programming I find it useful to divide memory into pages. It enables me to easily allocate memory to various tasks and to simply address it. Thus page $5500 indicates the bytes between $5500 and $55FF.

The eight sections of the database are illustrated in **Fig 1** and described below.

1. MAP. This is the most important section (it takes up the most space) and was the subject of the article in Issue 5.

2. HQ. This section contains the data for divisional and the regimental headquarters' data. There are 30 HQs in the game and 32 bytes have been allocated to each HQ (i.e. 30 * 32 = 960 bytes) hence 4 pages (4 * 256 = 1024 bytes) are reserved for this.

3. UN. The prefix UN used to describe this section stands for units and contains the battalion data. I will know that any variable

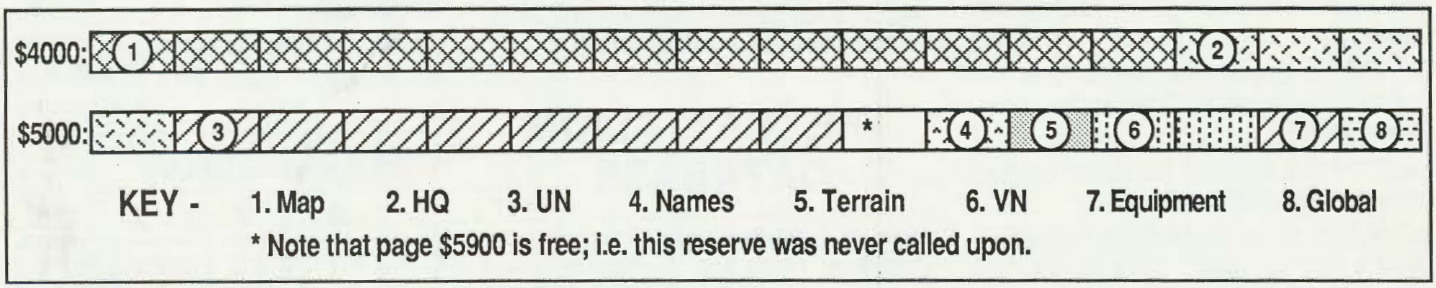


Fig 1. *Battlefront* Database Layout

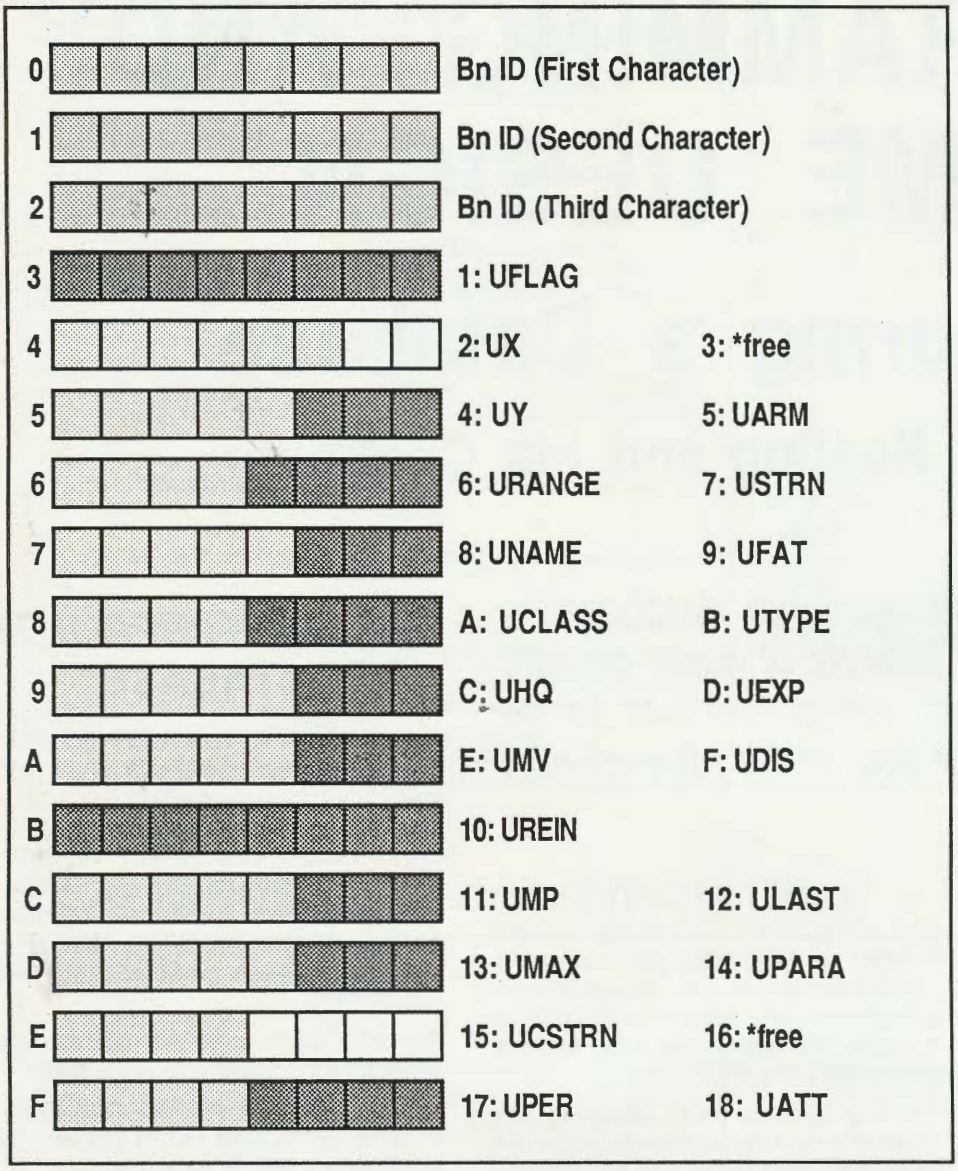

0 Bn ID (First Character)
1 Bn ID (Second Character)
2 Bn ID (Third Character)
3 1: UFLAG
4 2: UX 3: *free
5 4: UY 5: UARM
6 6: URANGE 7: USTRN
7 8: UNAME 9: UFAT
8 A: UCLASS B: UTYPE
9 C: UHQ D: UEXP
A E: UMV F: UDIS
B 10: UREIN
C 11: UMP 12: ULAST
D 13: UMAX 14: UPARA
E 15: UCSTRN 16: *free
F 17: UPER 18: UATT

Fig 2. Battalion Database Structure

within the game that starts with a 'U' will have something to do with battalions. I did not use 'BN' as a number of global variables already start with the letter 'B'. There is a total of 120 battalions each using 16 bytes (120 * 16 = 1920 bytes) and this fits into 8 pages (2048 bytes). I will expand on the way the battalion data was set up later in this article.

4. NAMES. This page is used to store the scenario briefing data and the names of the commanders.

5. TERRAIN. Contains the terrain names, movement and combat data.

6. VN. This section contains the names and details (12 for each side) of the 24 objectives. 20 bytes are allocated for each objective (24 * 20 = 480 bytes). VN occupies 2 pages (512 bytes).

7. EQUIPMENT. This page contains the 32 names of equipment in the scenario i.e. TIGER TANKS, RIFLES, etc.

8. GLOBALS. This page contains all global variables (variables that are used in all parts of the game as opposed to local variables that are used within a specific subroutine). Data in these pages include information on weather, victory and scenario details.

THE BATTALION DATABASE

There is a maximum of 120 battalions in *Battlefront*. In this type of database, space must be allocated for 120 battalions even though in a particular game only few battalions are being used. There are 24 variables and a 3 character ID in each battalion to fit the data into the 16 available bytes. As each character in the ID field takes up 1 byte the remaining 13 bytes must contain the 24 variables so that 1 byte may contain more than 1 variable.

Looking at **fig 2**, the 16 bytes have been laid out showing the bit structure. Each byte is made up of 8 bits (either 1 or 0). If a variable uses 2 bits it may contain a number between 0 and 3, 3 bits allows a value between 0 and 7, 4 bits between 0 and 15. The strength, USTRN, of a battalion has a maximum value of 15 and therefore is allocated 4 bits. The other bits in the byte containing USTRN are also a 0 to 15 value, URANGE, which indicates the range of the unit. A description of the variables that make up a battalion of *Battlefront* follows.

1. UFLAG. Each bit in this byte is used as a flag (8 flags in all). A flag is a computer term which means that a particular feature of the program is either on or off. If a particular bit is set (i.e. 1) then the flag is on and if not set (i.e. 0) then the flag is off. The flags used for a battalion are;

Bit 0. The battalion is *mechanized/not mechanized* (i.e. the battalion has a movement allowance greater than the MECH MIN value, as described in the *Battlefront* rule book).

Bit 1. Free.

Bit 2. Indicates that the battalion has been *routed/not routed.*

Bit 3. Is *contacted/not contacted* by an enemy regiment.

Bit 4. Is *engaged/not engaged* by an enemy regiment.

Bit 5. Indicates that the battalion has been involved in combat, either as the attacker or defender, during the turn.

Bit 6. Indicates that this battalion has been involved in minor combat during the turn.

Bit 7. Indicates that the battalion has been KIA'd (killed in action) or was not used for this scenario.

Therefore a battalion with UFLAG = $45, as illustrated in **fig 3**, tells us that it is a

Bit layout for UFLAG

7	6	5	4	3	2	1	0
0	1	0	0	0	1	0	1

Fig 3. UFLAG Structure

mechanized unit that has been routed and been involved in minor combat during the turn. If the routed flag is set then it would be impossible to set bits 3,4 or 5 as a routed unit cannot be involved in any combat other than minor combat.

2. UX (0-38; $0-$26). The x map co-ordinate. Co-ordinates go from 0 (extreme left column) to 38 (extreme right column).

3. *Free (0-3). Not used!

4. UY (0-27; $0-$1B). The y map co-ordinate. Co-ordinates go from 0 (top row) to 27 (bottom row).

5. UARM (0-2). Indicates whether this battalion is an ARMOUR, ARTILLERY or INFANTRY unit.

6. URANGE (0-15). The unit's range (in hexes).

7. USTRN (0-15). The unit's initial strength (0 = not used in the scenario).

8. UNAME (0-31). The index to the battalion equipment list. In the battalion in diagram 3 the equipment number is 2 which, when cross-indexed with the equipment data, gives the name 'MATILDA'.

9. UFAT (0-7). The battalion's fatigue state (0 = exhausted, 7 = fresh).

10 (#A). UCLASS (0-13). The type of battalion e.g. armour, anti-tank.

11 ($B). UTYPE (0-15). The weapon's relative effectiveness rating. This is a relative rating, so a Tiger tank may be 15 whereas a Sherman would be around 9.

12 ($C). UHQ (0-31). The index to the battalion's headquarters unit. An index of 12, for example, would mean that this battalion belongs to headquarters number 12. During the game only divisional assets can change this index.

13 ($D). UEXP (0-7). The battalion's experience rating (0=green, 7=veteran).

14 ($E). UMV (0-31). The maximum movement allowance that the unit can use.

15 ($F). UDIS (0-3). Indicates whether the arriving unit is in *normal, parachute, air-landing* or *amphibious* mode.

16 ($10). UREIN (0-63). This number tells at which turn this battalion will be placed on the map.

17 ($11). UMP (0-31). The movement point counter for use during the movement phase. During this phase the cost of moving across the map is subtracted from UMP and movement will cease when the UMP value becomes 0.

18 ($12). ULAST (0-6). While moving it is useful to know the last direction the unit traveled in, so that if two or more directions are possible, the battalion will tend to continue moving in the last direction.

19 ($13). UMAX (0-31). At various times during the game a unit will be limited to a maximum number of hexes irrespective of the movement points remaining. On the turn that they land, sea landing units have a maximum hex allowance of 2, and will only be be able to land and deploy, moving a total of two hexes.

20 ($14). UPARA (0-3). This number is entered during the create phase and then is passed to UDIS for game purposes. It remembers the method of entry to the board so it is possible to tell later in the game that this battalion started as a PARA unit etc.

21 ($15). UCSTRN (0-15). The current strength of the battalion. At the start of the game it takes the value of the initial strength, USTRN. When the current strength is 0 then the battalion is regarded as KIA'd and the 7th bit is set to indicate the battalion has been removed from the map.

22 ($16). *Free (0-15). I always try to keep something up my sleeve in case Ian changes his mind, and half a byte is better than nothing.

23 ($17). UPER (0-9). The percentage loss of the battalion, 0 = no loss, 9 = 90% loss. This is calculated by comparing UCSTRN with USTRN.

24 ($18). UATT (0-4). For divisional assets to show which regiment they are attached, 0 = in reserve, 1-4 = regiment #.

An example of this database is taken from the North African scenario in this magazine.

Figs 4 and 5 illustrate the structure.

The B4R armoured battalion from the 11 Ind/1 regiment has been given orders to advance toward HALFAYAPASS from its present location (26,7). It is a mechanized unit with a strength of 1 and a rating of 2 (this is not a good omen for the battalion as it faces some 88's with a rating of 14). They are veterans in a fresh fatigue state. ULAST is 0 as no last movement has yet been recorded. UATT is not used as this unit is not a divisional asset.

This is unit number 66 ($42) and as each unit occupies 16 bytes and the data starts at $5100 the data occupies $5520 to $552F ($42 * $10 + $5100 = $5520).

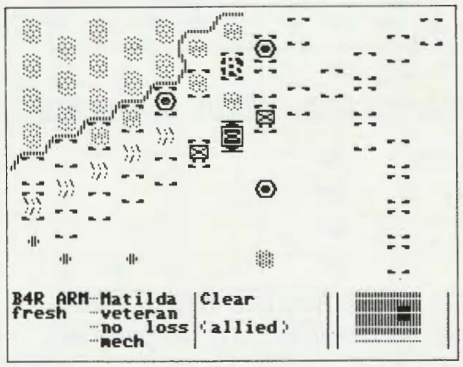


Fig 4. Unit #66

THE SUBROUTINES

The subroutines included in this article show how the battalion data can be accessed (INITUNIT), broken down (BRKUNIT) to a usable form and built back (BLDUNIT) to the database. Note that the subroutine listings can be found on pages 15-17.

When dealing with a battalion it is necessary to look at its strength, fatigue or experience etc. If the data is in the form shown in **fig 2** then any access to it would be difficult as, for example, the range, URANGE and strength, USTRN occupy the same byte.

To manipulate a battalion during a game it must be first addressed. INITUNIT locates the particular battalion within the battalion database, and then breaks it down, using BRKUNIT, to the 24 battalion variables.

In addressing the database I use the indirect addressing instructions LDA (L),Y and STA (L),Y. LDA (L),Y loads the accumulator with the address given in variable L and L+$1 indexed by the Y register.

Using the example in **fig 5**, this means that L and L +$1 would contain the address $5520. i.e. L contains $20 and L+$1 contains $55 and these are then read by the computer as the address $5520.

The Y register is then varied between $3 and $F to 'pick up' or 'put down' data. The Y register starts at $3 as the first 3 bytes (0,1 and 2) contain the ID of the unit and are not required for the running of the game.

In reading through the listing it is important to note the two machine language instructions LSR and ASL. LSR or *logical shift right* shifts all the bits 1 along to the right (the right most bit drops off the end; more or less). ASL shifts all the bits 1 along to the left. Have a look at **fig 6.**

In the BRKUNIT subroutine many variables are doubled up. By using LSR, as in fig 6, the

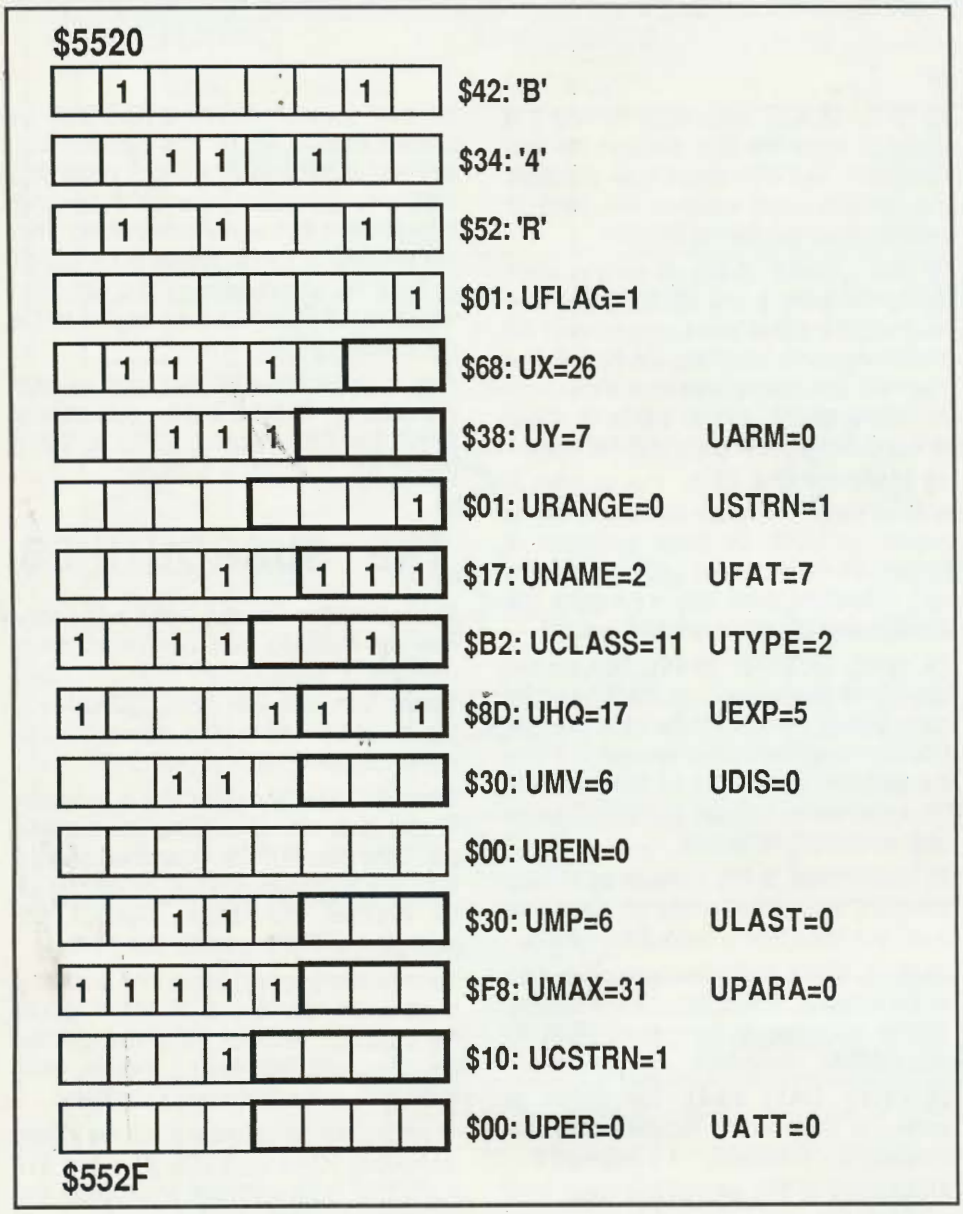


Fig 5. Database Structure for Unit #66

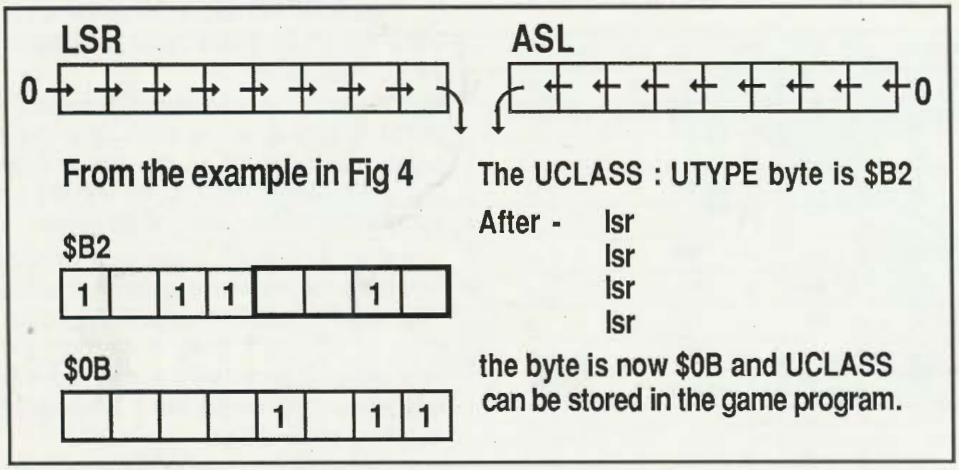


Fig 6. Using LSR and ASL

left most part can be recovered, then using the instruction AND, the remaining part can be retrieved and stored.

In BLDUNIT the left most part is taken first and shifted to the left using ASL the required number of bits. Then the ORA instruction is used to add the remaining variable to the database.

CONCLUSION

The development of the database in any game is an exciting process. It forms the structural basis of the game and from that basis the game is moulded into its final form.

If an unforeseen situation arises and major modifications are required, it can mean many hours of hard work which will test the determination of any programmer. It makes the task of careful initial database construction all the more important. ◆

Questions. . .

Continued from p.4

Battles in Normandy. There are two errors in the map. The arrow for the Utah map box actually points to the Cherbourg map box (*how could I make such a dumb mistake?*) and there is a road missing from the Omaha section of the map. Since the road is present on the disk this is only a cosmetic problem.

The option in ***Battles in Normandy*** which allows you to name an objective instead of using the arrow keys only works for letters in uppercase. Most objective names in the game are in lower case so you will have to use the arrow keys or change the objective names.

The scenario briefing in ***Battles in Normandy*** shows 'Condition' on the screen. The word should be 'Climate', as described in the rulebook.

In ***Battlefront*** and ***Battles in Normandy*** minefield and fort hexes do not automatically change control when they are occupied, but take variable number of turns to clear. The clearing is only triggered by units moving onto the hex. A unit which doesn't move in a minefield or fort hex will not cause any clearing. This usually only matters if the minefield or fort is also an objective hex taken at the very end of the game. If you have any problems with this, don't put minefields or forts directly on objectives. ◆

```
6000                    1               org  $6000
6000                    2               obj  $800
6000                    3  ;
6000                    4  ;listing of INITUNIT
6000                    5  ;BRKUNIT and BLDUNIT
6000                    6  ;
6000                    7  ;INITUNIT is called by JSR $6000
6000                    8  ;BRKUNIT is called by JSR $6021
6000                    9  ;BLDUNIT is called by JSR $60F2
6000                   10  ;
6000                   11  ;LUNIT indicates the start of the
6000                   12  ;battalion data
5100                   13  LUNIT       =    $5100
6000                   14  ;
0002                   15  L           epz  $2
0003                   16  H           epz  L+$1
6000                   17  ;
0300                   18  YES         =    $300
6000                   19  ;
0310                   20  UN          =    $310
0311                   21  UFLAG       =    UN+$1
0312                   22  UX          =    UN+$2
0313                   23  UFREE       =    UN+$3
0314                   24  UY          =    UN+$4
0315                   25  UARM        =    UN+$5
0316                   26  URANGE      =    UN+$6
0317                   27  USTRN       =    UN+$7
0318                   28  UNAME       =    UN+$8
0319                   29  UFAT        =    UN+$9
031A                   30  UCLASS      =    UN+$A
031B                   31  UTYPE       =    UN+$B
031C                   32  UHQ         =    UN+$C
031D                   33  UEXP        =    UN+$D
031E                   34  UMV         =    UN+$E
031F                   35  UDIS        =    UN+$F
0320                   36  UREIN       =    UN+$10
0321                   37  UMP         =    UN+$11
0322                   38  ULAST       =    UN+$12
0323                   39  UMAX        =    UN+$13
0324                   40  UPARA       =    UN+$14
0325                   41  UCSTRN      =    UN+$15
0326                   42  UFREE1      =    UN+$16
0327                   43  UPER        =    UN+$17
0328                   44  UATT        =    UN+$18
6000                   45  ;
6000                   46  ;the variable UN identifies the
6000                   47  ;number of the battalion being
6000                   48  ;dealt with
6000                   49  ;
6000                   50  INITUNIT
6000  A9 00            51                   lda  00
6002  85 03            52                   sta  H
6004  AD 10 03         53                   lda  UN
6007  85 02            54                   sta  L
6009                   55  ;multiply by 16
6009  06 02            56                   asl  L
600B  26 03            57                   rol  H
600D  06 02            58                   asl  L
600F  26 03            59                   rol  H
6011  06 02            60                   asl  L
6013  26 03            61                   rol  H
6015  06 02            62                   asl  L
6017  26 03            63                   rol  H
6019                   64  ;add address $51 to the high byte
6019  A9 51            65                   lda  /LUNIT
601B  18               66                   clc
601C  65 03            67                   adc  H
601E  85 03            68                   sta  H
6020  60               69                   rts
6021                   70  ;
6021                   71  BRKUNIT:
6021  20 00 60         72                   jsr  INITUNIT
6024                   73  ;
6024                   74  ;start at byte 3 as bytes 0, 1
6024                   75  ;and 2 contain the battalion ID
6024                   76  ;
6024  A0 03            77                   ldy  03
6026  B1 02            78                   lda  (L),Y
6028  8D 11 03         79                   sta  UFLAG
602B  C8               80                   iny
602C                   81  ;
602C  B1 02            82                   lda  (L),Y
602E  4A               83                   lsr
602F  4A               84                   lsr
6030  8D 12 03         85                   sta  UX
6033  B1 02            86                   lda  (L),Y
6035  29 03            87                   and  03
6037  8D 13 03         88                   sta  UFREE
603A  C8               89                   iny
603B                   90  ;
603B  B1 02            91                   lda  (L),Y
603D  4A               92                   lsr
603E  4A               93                   lsr
603F  4A               94                   lsr
6040  8D 14 03         95                   sta  UY
6043  B1 02            96                   lda  (L),Y
6045  29 07            97                   and  07
6047  8D 15 03         98                   sta  UARM
604A  C8               99                   iny
604B                  100  ;
604B  B1 02           101                   lda  (L),Y
604D  4A              102                   lsr
604E  4A              103                   lsr
604F  4A              104                   lsr
6050  4A              105                   lsr
6051  8D 16 03        106                   sta  URANGE
6054  B1 02           107                   lda  (L),Y
6056  29 0F           108                   and  0F
6058  8D 17 03        109                   sta  USTRN
605B  C8              110                   iny
605C                  111  ;
605C  B1 02           112                   lda  (L),Y
605E  4A              113                   lsr
605F  4A              114                   lsr
```

```
6060  4A          115          lsr
6061  8D 18 03    116          sta  UNAME
6064  B1 02       117          lda  (L),Y
6066  29 07       118          and 07
6068  8D 19 03    119          sta  UFAT
606B  C8          120          iny
606C              121  ;
606C  B1 02       122          lda  (L),Y
606E  4A          123          lsr
606F  4A          124          lsr
6070  4A          125          lsr
6071  4A          126          lsr
6072  8D 1A 03    127          sta  UCLASS
6075  B1 02       128          lda  (L),Y
6077  29 0F       129          and 0F
6079  8D 1B 03    130          sta  UTYPE
607C  C8          131          iny
607D              132  ;
607D  B1 02       133          lda  (L),Y
607F  4A          134          lsr
6080  4A          135          lsr
6081  4A          136          lsr
6082  8D 1C 03    137          sta  UHQ
6085  B1 02       138          lda  (L),Y
6087  29 07       139          and 07
6089  8D 1D 03    140          sta  UEXP
608C  C8          141          iny
608D              142  ;
608D  B1 02       143          lda  (L),Y
608F  4A          144          lsr
6090  4A          145          lsr
6091  4A          146          lsr
6092  8D 1E 03    147          sta  UMV
6095  B1 02       148          lda  (L),Y
6097  29 07       149          and 07
6099  8D 1F 03    150          sta  UDIS
609C  C8          151          iny
609D              152  ;
609D  B1 02       153          lda  (L),Y
609F  8D 20 03    154          sta  UREIN
60A2  C8          155          iny
60A3              156  ;
60A3  B1 02       157          lda  (L),Y
60A5  4A          158          lsr
60A6  4A          159          lsr
60A7  4A          160          lsr
60A8  8D 21 03    161          sta  UMP
60AB  B1 02       162          lda  (L),Y
60AD  29 07       163          and 07
60AF  8D 22 03    164          sta  ULAST
60B2  C8          165          iny
60B3              166  ;
60B3  B1 02       167          lda  (L),Y
60B5  4A          168          lsr
60B6  4A          169          lsr
60B7  4A          170          lsr
60B8  8D 23 03    171          sta  UMAX
```

```
60BB  B1 02       172          lda  (L),Y
60BD  29 07       173          and 07
60BF  8D 24 03    174          sta  UPARA
60C2  C8          175          iny
60C3              176  ;
60C3  B1 02       177          lda  (L),Y
60C5  29 0F       178          and 0F
60C7  8D 26 03    179          sta  UFREE1
60CA  B1 02       180          lda  (L),Y
60CC  4A          181          lsr
60CD  4A          182          lsr
60CE  4A          183          lsr
60CF  4A          184          lsr
60D0  8D 25 03    185          sta  UCSTRN
60D3  C8          186          iny
60D4              187  ;
60D4  B1 02       188          lda  (L),Y
60D6  29 0F       189          and 0F
60D8  8D 28 03    190          sta  UATT
60DB  B1 02       191          lda  (L),Y
60DD  4A          192          lsr
60DE  4A          193          lsr
60DF  4A          194          lsr
60E0  4A          195          lsr
60E1  8D 27 03    196          sta  UPER
60E4  C8          197          iny
60E5              198  ;
60E5              199  ;the variable YES is set to 0
60E5              200  ;if the battalion has been
60E5              201  ;KIA'd or is not being used
60E5              202  ;otherwise YES = 1
60E5              203  ;
60E5  A2 00       204               ldx  00
60E7  AD 11 03    205               lda  UFLAG
60EA  30 02       206               bmi  BRKUX
60EC  A2 01 00    207               ldx  01
60EE  8E 00 03    208  BRKUX       stx  YES
60F1              209  ;
60F1  60          210               rts
60F2              211  ;
60F2              212  BLDUNIT:
60F2  20 00 60    213               jsr  INITUNIT
60F5              214  ;
60F5  A0 03       215               ldy  03
60F7  AD 11 03    216               lda  UFLAG
60FA  91 02       217               sta  (L),Y
60FC  C8          218               iny
60FD              219  ;
60FD  AD 12 03    220               lda  UX
6100  0A          221               asl
6101  0A          222               asl
6102  0D 13 03    223               ora  UFREE
6105  91 02       224               sta  (L),Y
6107  C8          225               iny
6108              226  ;
6108  AD 14 03    227               lda  UY
610B  0A          228               asl
```

```
610C  0A          229            asl
610D  0A          230            asl
610E  0D 15 03    231            ora  UARM
6111  91 02       232            sta  (L),Y
6113  C8          233            iny
6114              234  ;
6114  AD 16 03    235            lda  URANGE
6117  0A          236            asl
6118  0A          237            asl
6119  0A          238            asl
611A  0A          239            asl
611B  0D 17 03    240            ora  USTRN
611E  91 02       241            sta  (L),Y
6120  C8          242            iny
6121              243  ;
6121  AD 18 03    244            lda  UNAME
6124  0A          245            asl
6125  0A          246            asl
6126  0A          247            asl
6127  0D 19 03    248            ora  UFAT
612A  91 02       249            sta  (L),Y
612C  C8          250            iny
612D              251  ;
612D  AD 1A 03    252            lda  UCLASS
6130  0A          253            asl
6131  0A          254            asl
6132  0A          255            asl
6133  0A          256            asl
6134  0D 1B 03    257            ora  UTYPE
6137  91 02       258            sta  (L),Y
6139  C8          259            iny
613A              260  ;
613A  AD 1C 03    261            lda  UHQ
613D  0A          262            asl
613E  0A          263            asl
613F  0A          264            asl
6140  0D 1D 03    265            ora  UEXP
6143  91 02       266            sta  (L),Y
6145  C8          267            iny
6146              268  ;
6146  AD 1E 03    269            lda  UMV
6149  0A          270            asl
614A  0A          271            asl
614B  0A          272            asl
614C  0D 1F 03    273            ora  UDIS
614F  91 02       274            sta  (L),Y
6151  C8          275            iny
6152              276  ;
6152  AD 20 03    277            lda  UREIN
6155  91 02       278            sta  (L),Y
6157  C8          279            iny
6158              280  ;
6158  AD 21 03    281            lda  UMP
615B  0A          282            asl
615C  0A          283            asl
615D  0A          284            asl
615E  0D 22 03    285            ora  ULAST
6161  91 02       286            sta  (L),Y
6163  C8          287            iny
6164              288  ;
6164  AD 23 03    289            lda  UMAX
6167  0A          290            asl
6168  0A          291            asl
6169  0A          292            asl
616A  0D 24 03    293            ora  UPARA
616D  91 02       294            sta  (L),Y
616F  C8          295            iny
6170              296  ;
6170  AD 25 03    297            lda  UCSTRN
6173  0A          298            asl
6174  0A          299            asl
6175  0A          300            asl
6176  0A          301            asl
6177  0D 26 03    302            ora  UFREE1
617A  91 02       303            sta  (L),Y
617C  C8          304            iny
617D              305  ;
617D  AD 27 03    306            lda  UPER
6180  0A          307            asl
6181  0A          308            asl
6182  0A          309            asl
6183  0A          310            asl
6184  0D 28 03    311            ora  UATT
6187  91 02       312            sta  (L),Y
6189  C8          313            iny
618A              314  ;
618A  60          315            rts
618B              316  ;
618B              317            end
      *****       END OF ASSEMBLY
```


REACH FOR THE STARS (3rd Ed)

Coming Soon for the

Macintosh, IIGS, Amiga and IBM

THE FALL OF CHERBOURG

A Campaign Variant for
Battles in Normandy

by Andrew Taubman

*Those of you who have seen our **Battles in Normandy** game will realize this campaign variant should have been included in the scenarios section of the Player's Manual. As we said on page 60 of that manual, there just wasn't enough room.*

INTRODUCTION

We have rectified the situation. The campaign variant instructions are provided herewith together with Axis and Allied record sheets which will make the transition as painless as possible.

We advise you to play both the Utah and Cherbourg scenarios before experimenting with the campaign; or at least be familiar with the game mechanics.

We have divided the procedure for implementing the campaign into separate stages which should be followed in strict sequence.

STAGE ONE

Play a game of Utah as normal (two-player is recommended). When any 2 of Portbail, Barneville and Carteret are controlled by the US, or when the game ends (whichever comes first), stop the game and save it. Note down each side's victory points. Reboot the computer and go into create on that saved game.

STAGE TWO

Examine the Campaign Record Sheets provided for both players and make photocopies of them if you don't want to write in the magazine.

Certain information from the game just saved must be recorded on the ***Utah*** section of each sheet. Note down the location, strength, fatigue and attachment (if divisional asset) of each unit whose I.D. appears on the sheet. Note that only the locations of the units of the 90th US Infantry need to be recorded. Similarly, only the strengths of the units in the German 77th Infantry should be written down.

STAGE THREE

The next step is to prepare the Cherbourg sections of the Campaign Record sheets. Basically, this means transfering information from the Utah section to the corresponding location in the Cherbourg section. There are a few things to remember when doing this.

(a). Locations. To change the Utah map locations to Cherbourg map locations, add 2 to the x co-ordinate and 16 to the y co-ordinate. For example, a unit in hex 26,1 (Montebourg) on the Utah map would have its location on the Cherbourg map recorded as 28, 17. If this transfer would place the unit off the map, locate it in the nearest, sensible map edge hex.

(b). US Units. Any US non-artillery unit may have its strength increased to 8, but it loses 1 experience point for every 2 strength points added. (Fractions are rounded down, but the minimum reduction for a unit whose strength is increased is 1). For example, the 3rd Bn from the 12 Rgt of the 4th US Infantry ends the Utah scenario with a strength of five. If its strength is increased to 8, it will have its experience reduced by 1.

Artillery units may have their strength increased to 4 but a penalty of 1 experience point for each strength point added applies.

(c). German Units. Any German unit with less than 3 strength points may have its strength increased to 3. In addition, sum the total strength points remaining in the 77th Infantry and add these as you see fit to any non-armour, non-artillery unit(s) on the Cherbourg section of the record sheet.

If any units are resurrected by these procedures, care must be taken that they are not behind enemy lines, or on top of another unit. Move the unit to a sensible location if necessary. Divisional assets may be moved to any location and reassigned to any regiment.

(d). American and German Units. Any unit with a fatigue value lower than 4 should have it adjusted to 4.

STAGE FOUR

The next step is to load the Cherbourg scenario and save it as a saved game immediately. Go into create the creation routines. Enter each unit's position, strength and fatigue as noted in the Cherbourg sections of the record sheets. The US 79th division should be put in the locations that the 90th occupied. The German 919th regiment, which was in the 91st division, now appears in the 709th. In several cases, the unit ID and type will not match; ignore this. The Germans were extemporizing constantly in this period.

Adjust the map so that each hex is controlled by the appropriate side.

Save the game under a new name. Now play the new game as normal. At the end, add each side's victory points from the Cherbourg scenario to those gained in Utah scenario. The highest overall total is the winner. ◆

US CAMPAIGN RECORD (UTAH)

Victory Points

4th US Infantry

XX HQ Loc

Div. Assets

I.D.	Loc	Str	Fat	Att
20				
70				
4				
801				

8 Rgt Adm Sup

I.D.	Loc	Str	Fat
1			
2			
3			
29			

12 Rgt Adm Sup

I.D.	Loc	Str	Fat
1			
2			
3			
42			

22 Rgt Adm Sup

I.D.	Loc	Str	Fat
1			
2			
3			
44			

90th US Infantry

XX HQ Loc

Div. Assets

I.D.	Loc
345	
712	
315	
607	

357 Rgt

I.D.	Loc
1	
2	
3	
915	

358 Rgt

I.D.	Loc
1	
2	
3	
343	

359 Rgt

I.D.	Loc
1	
2	
3	
344	

9th US Infantry

XX HQ Loc

Div. Assets

I.D.	Loc	Str	Fat	Att
34				
746				
15				
899				

39 Rgt Adm Sup

I.D.	Loc	Str	Fat
1			
2			
3			
26			

47 Rgt Adm Sup

I.D.	Loc	Str	Fat
1			
2			
3			
60			

60 Rgt Adm Sup

I.D.	Loc	Str	Fat
1			
2			
3			
84			

US CAMPAIGN RECORD (CHERBOURG)

Victory Points

4th US Infantry

XX HQ Loc

Div. Assets

I.D.	Loc	Str	Fat	Att
20				
70				
4				
801				

8 Rgt Adm Sup

I.D.	Loc	Str	Fat
1			
2			
3			
29			

12 Rgt Adm Sup

I.D.	Loc	Str	Fat
1			
2			
3			
42			

22 Rgt Adm Sup

I.D.	Loc	Str	Fat
1			
2			
3			
44			

79th US Infantry

XX HQ Loc

Div. Assets

I.D.	Loc
312	
304	

313 Rgt

I.D.	Loc
1	
2	
3	
310	

314 Rgt

I.D.	Loc
1	
2	
3	
311	

315 Rgt

I.D.	Loc
1	
2	
3	
904	

9th US Infantry

XX HQ Loc

Div. Assets

I.D.	Loc	Str	Fat	Att
34				
746				
15				
899				

39 Rgt Adm Sup

I.D.	Loc	Str	Fat
1			
2			
3			
26			

47 Rgt Adm Sup

I.D.	Loc	Str	Fat
1			
2			
3			
60			

60 Rgt Adm Sup

I.D.	Loc	Str	Fat
1			
2			
3			
84			

GERMAN CAMPAIGN RECORD (UTAH)

Victory Points

77th Infantry

Div. Assets

I.D.	Str
77F	
177	
177	
177	

1049 Rgt

I.D.	Str
I	
II	
III	
261	

1050 Rgt

I.D.	Str
I	
II	
III	
252	

Ind. Rgt

I.D.	Str
261	
261	

91st Air Landing

XX HQ Loc

Div. Assets

I.D.	Loc	Str	Fat	Att
91F				
191				
191				
191				

1057 R. Adm Sup

I.D.	Loc	Str	Fat
I			
II			
III			

1058 R. Adm Sup

I.D.	Loc	Str	Fat
I			
II			
III			

919 Rgt Adm Sup

I.D.	Loc	Str	Fat
I			
II			
III			

243rd Infantry

XX HQ Loc

Div. Assets

I.D.	Loc	Str	Fat	Att
243				
PJG				
243				
243				

921 Rgt Adm Sup

I.D.	Loc	Str	Fat
I			
II			
III			
458			

922 Rgt Adm Sup

I.D.	Loc	Str	Fat
I			
II			
III			

GERMAN CAMPAIGN RECORD (CHERBOURG)

Victory Points

709th Infantry

919 Rgt Adm Sup

I.D.	Loc	Str	Fat
I			
II			
AOK			

91st Air Landing

XX HQ Loc

Div. Assets

I.D.	Loc	Str	Fat	Att
91F				
191				
191				
191				

1057 R. Adm Sup

I.D.	Loc	Str	Fat
I			
II			
OST			

1058 R. Adm Sup

I.D.	Loc	Str	Fat
OST			
II			
OST			

243rd Infantry

XX HQ Loc

Div. Assets

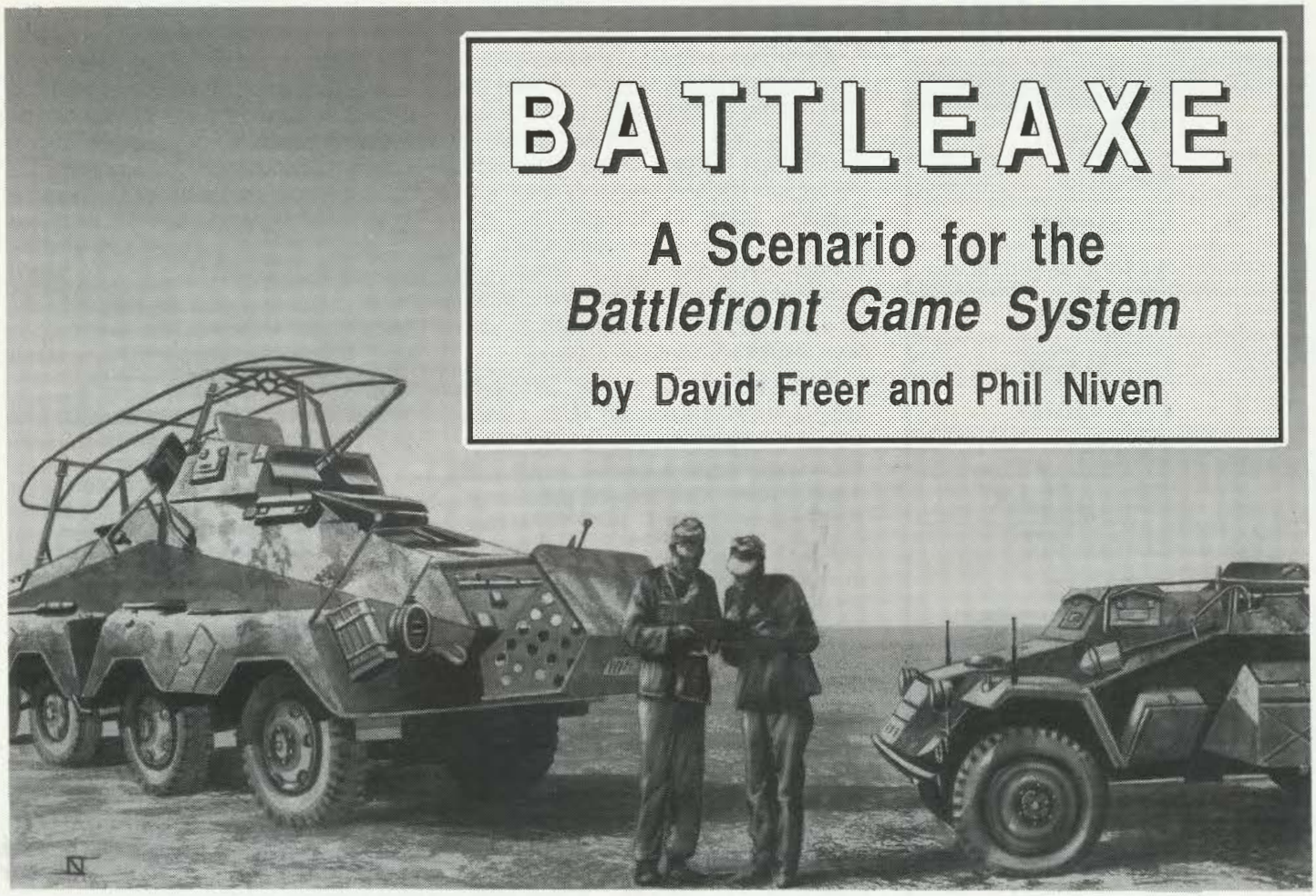
I.D.	Loc	Str	Fat	Att
243				
PJG				
101				
243				

921 Rgt Adm Sup

I.D.	Loc	Str	Fat
I			
II			
OST			
30			

922 Rgt Adm Sup

I.D.	Loc	Str	Fat
I			
II			
OST			



BATTLEAXE

A Scenario for the *Battlefront Game System*

by David Freer and Phil Niven

Since the arrival of Rommel in February 1941, the British force responsible for sweeping a demoralized Italian army before it, had become a confused and defeated rabble.

THE SITUATION

April 1941 saw the beginning of a lightning thrust across Cyrenaica by the 5th Light Division (later the 21st Panzer Division), supported by the best of the Italian divisions, Ariete and Brescia. By the 10th, Tobruk had been cut off. The advanced forces of Rommel's command had pushed the British back to Sollum and Bardia, where stretched supply lines forced a halt. The port of Tobruk had been bypassed and a determined and quick assault was called for before the defenders could entrench themselves properly. Further advances could not be made with an enemy strong-point in the Axis flank which threatened an already stretched supply line. The initial assault only just failed, but this failure ensured a long and protracted siege by the Axis.

Sparring in the Bardia-Sollum area continued throughout April and May, while pressure was applied to the Tobruk defences. On the 15th of May the British launched 'Operation Brevity', in an attempt to capture Bardia and Sollum preparatory to launching a relief attempt on Tobruk.

The operation was a failure although it resulted in the temporary capture of the critical Halfaya pass. This was recaptured by the Germans on the 27th of May. In a desperate attempt to gain armour superiority before the 15th Panzer Division was fully available to Rommel, Churchill had despatched a fast convoy ('Operation Tiger') of tanks and planes through the Mediterranean. This arrived in mid May but by the time the tanks had been refitted and were ready for use, the last elements of the 15th Panzer Division had also arrived. So the situation stood at the beginning of June.

The Axis were set up along a defensive line running Halfaya Pass - Mussaid - Capuzzo. This line was defended by Rommel's non-mobile troops (Oasis Companies and some Italian infantry from the 61st and 62nd regiments), along with miscellaneous support troops, artillery and some 88mm Flak guns. In a mobile reserve Rommel had the 8th Panzer Regiment and supporting arms (at Bardia), with elements of the 104th Panzergrenadier Regiment (dismounted) near Halfaya Pass. The rest of the 104th and the 115th Panzergrenadier Regiment were still at Ras el Madauer. The 5th Light Division was deployed as the front reserve south of Tobruk. German records show that they had

Equipment

0	
1	Rifleman
2	Matilda
3	Crusader
4	17Pdr AT
5	25PdrArt
6	Armd Car
7	Hvy Wpns
8	Mot Inf
9	88mmFLAK
10	50mm AT
11	PzKw III
12	PzKw IV
13	Motorcyl
14	105mmArt
15	PzKw II
16	150mmArt
17	Halftrak
18	Mot Inf
19	75mm Art
20	76mm AT

about 150 tanks, only 95 of which were PzKfw Mk IIIs or Mk IVs.

The British had two divisions (the 4th Indian and the 7th Armoured), plus the 22nd Guards brigade for the assault. The 4th Indian was divided into two attack elements, one attacking along the coast and the other along the 200m high escarpment, towards Halfaya Pass. both had tank support detached from the 4th Royal Tank Regiment (RTR) of the 4th Armoured brigade. The 22nd Guards Brigade, supported by the 4th Armoured Brigade were to sweep into the Capuzzo area, with the 7th Armoured Brigade protecting the desert flank. British records show them having 190 tanks, 100 Matildas and 90 Cruisers.

Radio intercepts had warned the Axis of the impending attack, and Rommel made his plans accordingly. He kept the 8th Panzer Regiment uncommitted during the early hours of the battle in mobile reserve, allowing the pattern of the attack to become clear before committing them. Word was sent to call up the 5th Light Division. On the British side, the attack began reasonably well with Capuzzo falling on schedule, but stiff resistance was met on both flanks. At Halfaya Pass, the coastal attack was supported by 6 Matilda. Four were disabled by a minefield that was supposed to have been cleared and the attack failed.

Above the escarpment, the 2nd Cammerons and 12 Matildas assaulted Halfaya Pass without the support of their artillery, which had become bogged in sand on the approach march. Holding their fire until close range, the 88s accounted for 11 of the 12 Matildas, halting the attack.

In the centre, the troops at Point 206 repelled the initial assault, but the British superiority in numbers saw them pressing the Capuzzo defences. The 4th RTR finally took Capuzzo in the afternoon, and the 22nd Guards consolidated.

At Hafid Ridge (Point 208), a succession of ridges and depressions led the 7th RTR into numerous German ambushes. One position of guns was over-run, but reinforcements saw the 7th retreat with little to show for their efforts.

On the 16th the battle was renewed, with the Scots Guards capturing Musaid and threatening the outskirts of Sollum. The Germans counter-attacked several times at Capuzzo that day, but without giving the British the decisive tank battle they so desperately sought. The Germans none-the-less suffered heavy tank casualties, but managed to retain control of the battlefields and repair their damaged tanks quickly. Halfaya Pass again proved the rock on which the British attack foundered.

On the 17th the situation worsened for the British as the Germans, with the 5th Light leading, started enveloping the British flank. They launched their own flanking attack about an hour before the British started theirs, and caught the 7th Armoured Brigade forming up. Pursuing the fleeing brigade, the 5th Light headed for Sidi Sulmen. Later that day the British decided the operation could no longer succeed, and recalled their forces. The Germans captured Sidi Sulmen and closed in on Halfaya Pass from the south, hoping to catch and pin the British forces. The British, however, had retired just in time to avoid meeting an untimely demise.

The British defeat at Halfaya Pass was to have severe repercussions. Wavell was finally sacked by Churchill, and the British took nearly six months to recover and be ready to launch another offensive in North Africa. The operation cost the British 64 destroyed or abandoned Matildas, and 23 destroyed Cruisers. The Germans lost nearly 50 tanks, but held the battlefield and so were able to repair most of these, as well as some captured British tanks. The operation, for which Churchill had great hopes, was quietly forgotten on the British home front.

The battle was further relegated to the back pages as, just two weeks later, Hitler launched 'Operation Barbarossa'.

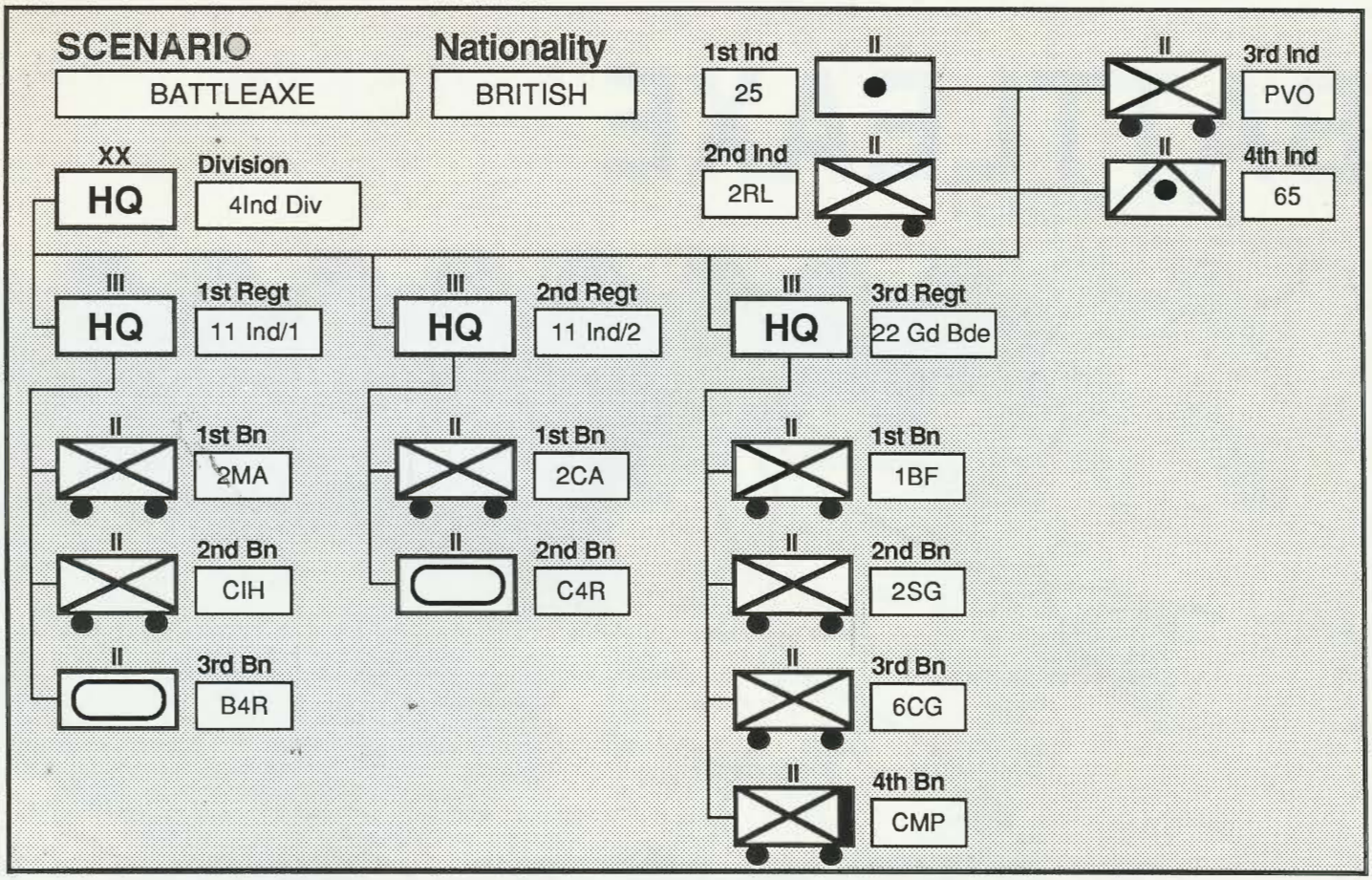
THE SCENARIO

The Desert War was typified by the often decisive use of armour and technology and the fluidity of the battlefield. Units would regularly be cut off, but very rarely destroyed. Lightning thrust and counterthrust were the order of the day, an attribute the *Battlefront Game System* simulates very well.

Battleaxe recreates the British attempt to relieve Tobruk between the 15th and 18th of June 1941. The scale used is one mile per hex with battalion and company sized units. The scenario is short and can be broken into two distinct phases - the British Offensive and the German Counterattack. Each side is required to conduct both offensive and defensive operations (sometimes simultaneously) requiring careful commitment of units. The following notes are drawn from over a hundred playtests of the scenario.

The first day of the assault will ultimately determine if the British win the scenario. The British must aim to clear the frontier positions quickly while preparing and probing Halfaya Pass with the Indian Division. Speed is of the essence because the Germans are quickly reinforced during the second day. If Musaid, Capuzzo and Point 208 can be taken by the end of the first day then you are well on target. Halfaya Pass must be taken no later than noon on the second day, or the pints that the Germans have gained through holding it will be too hard to overhaul. Historically the Germans act of holding the Pass during the whole battle diverted

Continued on p.48



HEADQUARTERS DATA

FORMATION		XX HQ	1/RHQ	2/RHQ	3/RHQ	4/RHQ
HQ I.D.	[8]	4Ind Div	11 Ind/1	11 Ind/2	22 Gd Bde	
UNIT TYPE	[8]	Infantry	Infantry	Infantry	Mot Inf	
HQ ADMIN	0-7	4	4	4	5	
LEADERSHIP	0-7	4	6	5	6	
HQ SUPPLY	0-7	5	5	5	5	
MOVEMENT	0-31	6	N/A	N/A	N/A	N/A
ARRIVAL	0-63	0	N/A	N/A	N/A	N/A
LOCATION	(x,y)	26,13	N/A	N/A	N/A	N/A

BATTALION DATA

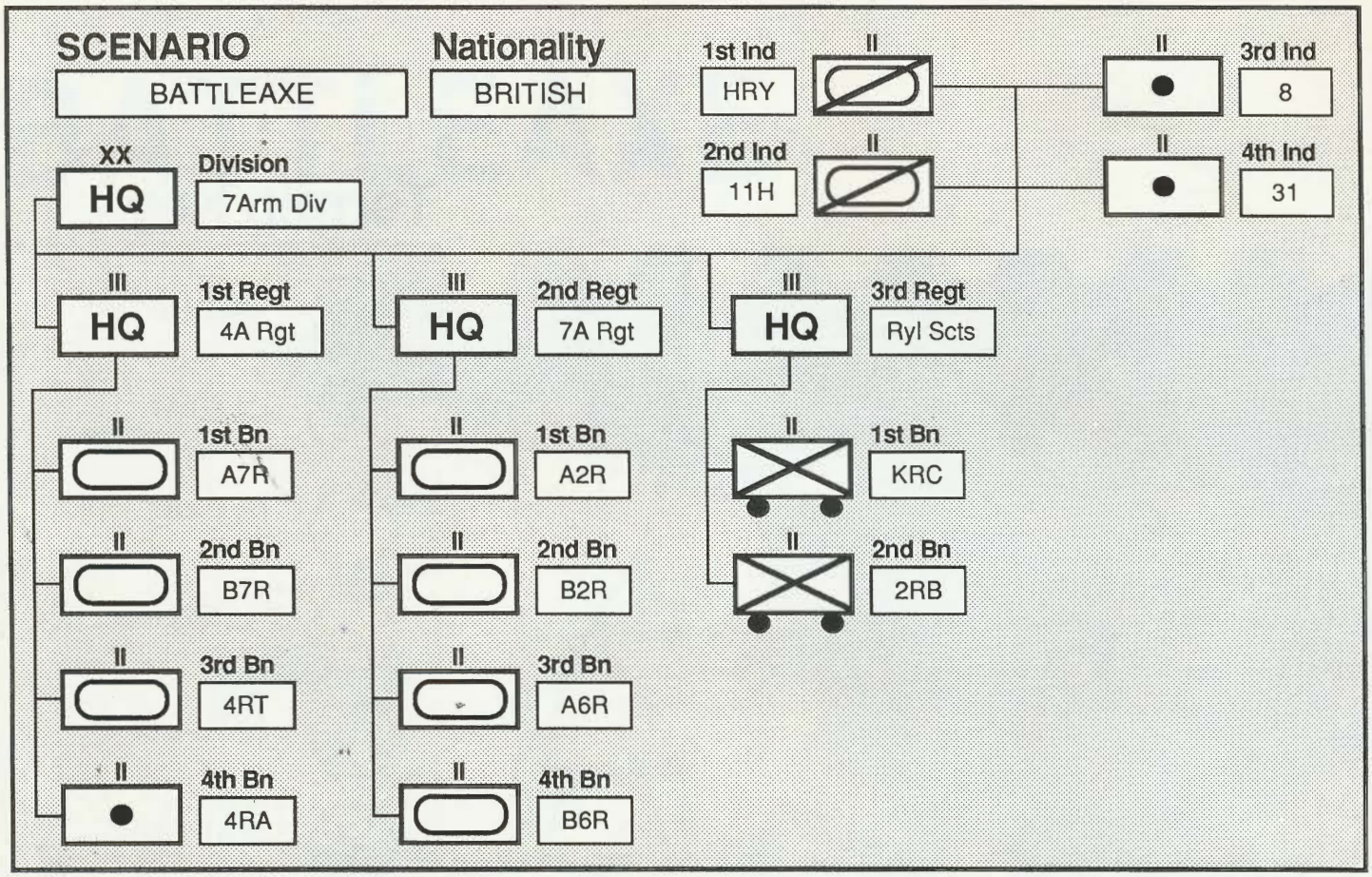
FORMATION	II/III	1/1	2/1	3/1	4/1	1/2	2/2	3/2	4/2	1/3	2/3	3/3	4/3	1/4	2/4	3/4	4/4	1/-	2/-	3/-	4/-
UNIT I.D.	[3]	2MA	CIH	B4R		2CA	C4R			1BF	2SG	6CG	CMP					25	2RL	PVO	65
LOCATION	(x,y)	25,7	27,6	26,7		22,12	23,12			22,14	23,14	24,15	25,15					30,13	32,12	26,13	26,15
CLASS	0-13	1	1	11		1	11			1	1	1	4					13	1	1	9
MODE	0-3	0	0	0		0	0			0	0	0	0					0	0	0	0
EQUIPM'T	0-31	1	1	2		1	2			1	1	1	7					5	1	1	4
MOVEMENT	0-31	9	9	6		9	6			8	8	8	4					8	10	10	8
STRENGTH	0-15	9	8	1		11	2			8	9	9	8					8	2	7	8
RATING	0-15	9	7	2		10	2			6	7	7	7					5	6	5	8
RANGE	0-15	0	0	0		0	0			0	0	0	0					3	0	0	1
ARRIVAL	0-63	0	0	0		0	0			0	0	0	0					0	0	0	0
FATIGUE	0-7	7	7	7		7	7			7	7	7	7					7	7	7	7
EXPERIENCE	0-7	5	5	5		5	5			5	6	6	5					4	4	4	4
ATTACHM'T	0-4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2	1	2	3

BATTLEAXE

Bardia
MEDITERRANEAN S
Bir ez Zemla
Sollum
Sidi Aziez
Musaid
Halfaya Pass
Capuzzo
Qalala
Point 208
Point 206
Hal
Sidi Sulmen
Sidi Omar
Point 204
Bir Scheferzen

Terrain Key

- OCEAN
- CLEAR
- SLOPE
- SAND
- ROUGH
- MARSH
- ESCARPMENT
- PASS
- HILL
- MINEFIELD
- FORT
- TRACK
- TOWN
- FRONT LINE

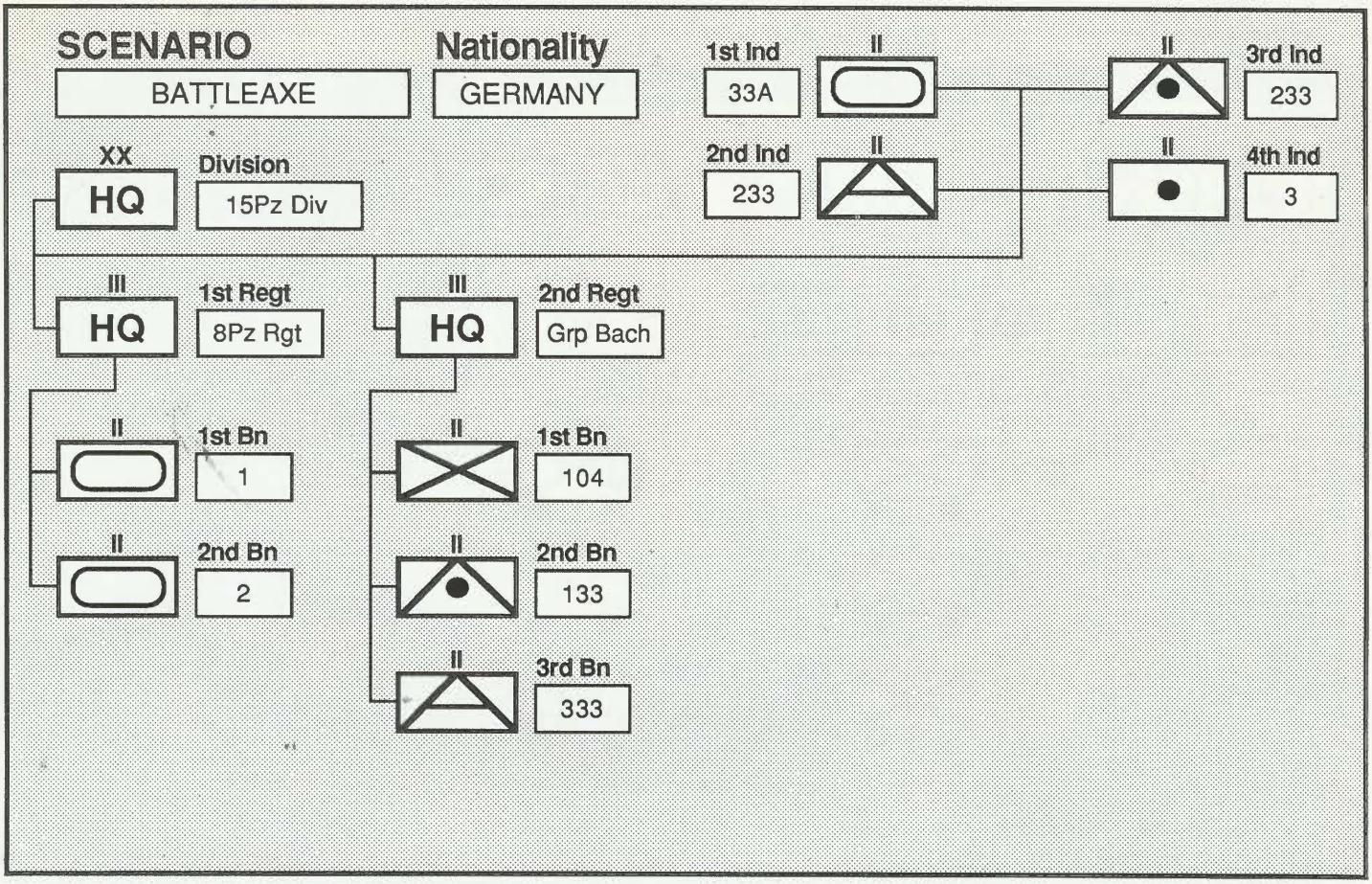


HEADQUARTERS DATA

FORMATION		XX HQ	1/RHQ	2/RHQ	3/RHQ	4/RHQ
HQ I.D.	[8]	7Arm Div	4A Rgt	7A Rgt	Ryl Scts	
UNIT TYPE	[8]	Armour	Armour	Armour	Mot Inf	
HQ ADMIN	0-7	4	4	4	4	
LEADERSHIP	0-7	4	4	4	5	
HQ SUPPLY	0-7	5	5	5	5	
MOVEMENT	0-31	6	N/A	N/A	N/A	N/A
ARRIVAL	0-63	0	N/A	N/A	N/A	N/A
LOCATION	(x,y)	20,17	N/A	N/A	N/A	N/A

BATTALION DATA

FORMATION	II/III	1/1	2/1	3/1	4/1	1/2	2/2	3/2	4/2	1/3	2/3	3/3	4/3	1/4	2/4	3/4	4/4	1/-	2/-	3/-	4/-
UNIT I.D.	[3]	A7R	B7R	4RT	4RA	A2R	B2R	A6R	B6R	KRC	2RB							HRY	11H	8	31
LOCATION	(x,y)	16,13	17,13	15,15	16,16	13,18	12,19	14,18	12,20	17,14	18,15							16,15	16,14	18,16	12,20
CLASS	0-13	11	11	11	13	11	11	11	11	1	1							11	11	13	13
MODE	0-3	0	0	0	0	0	0	0	0	0	0							0	0	0	0
EQUIPM'T	0-31	2	2	2	5	3	3	3	3	1	1							6	6	5	5
MOVEMENT	0-31	6	6	6	8	8	8	8	8	9	9							14	14	6	8
STRENGTH	0-15	6	6	3	8	8	8	7	8	9	9							2	6	7	9
RATING	0-15	2	2	2	5	7	7	7	7	6	6							3	3	5	5
RANGE	0-15	0	0	0	3	1	1	1	1	0	0							0	0	3	3
ARRIVAL	0-63	0	0	0	0	0	0	0	0	0	0							0	0	0	0
FATIGUE	0-7	7	7	7	7	7	7	7	7	7	7							7	7	7	7
EXPERIENCE	0-7	5	5	5	4	4	4	4	4	5	5							5	5	4	4
ATTACHM'T	0-4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	1	3	2

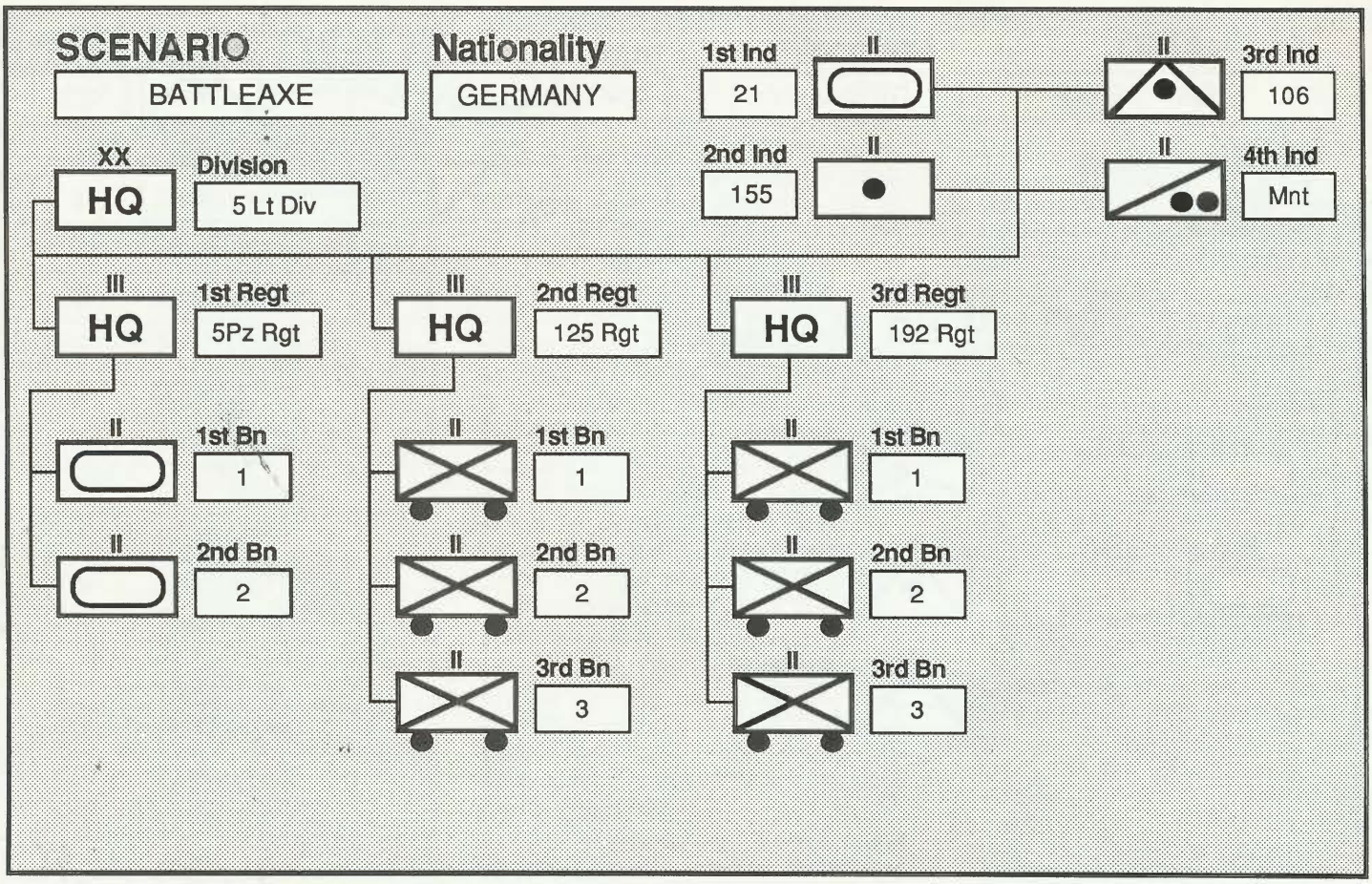


HEADQUARTERS DATA

FORMATION		XX HQ	1/RHQ	2/RHQ	3/RHQ	4/RHQ
HQ I.D.	[8]	15Pz Div	8Pz Rgt	Grp Bach		
UNIT TYPE	[8]	Panzer	Panzer	Infantry		
HQ ADMIN	0-7	7	7	6		
LEADERSHIP	0-7	7	7	7		
HQ SUPPLY	0-7	6	6	5		
MOVEMENT	0-31	6	N/A	N/A	N/A	N/A
ARRIVAL	0-63	2	N/A	N/A	N/A	N/A
LOCATION	(x,y)	0,5	N/A	N/A	N/A	N/A

BATTALION DATA

FORMATION	II/III	1/1	2/1	3/1	4/1	1/2	2/2	3/2	4/2	1/3	2/3	3/3	4/3	1/4	2/4	3/4	4/4	1/-	2/-	3/-	4/-
UNIT I.D.	[3]	1	2			104	133	333										33A	233	233	3
LOCATION	(x,y)	8,3	9,3			17,9	17,10	16,10										9,8	6,4	7,4	10,5
CLASS	0-13	11	11			0	9	9										11	9	9	13
MODE	0-3	0	0			0	0	0										0	0	0	0
EQUIPM'T	0-31	11	12			1	10	9										15	9	10	16
MOVEMENT	0-31	11	10			0	0	0										12	8	8	5
STRENGTH	0-15	9	6			10	4	3										10	6	6	4
RATING	0-15	9	10			11	9	14										6	14	9	10
RANGE	0-15	1	0			0	2	2										1	2	2	3
ARRIVAL	0-63	2	2			0	0	0										0	0	0	0
FATIGUE	0-7	2	2			6	6	6										5	6	5	6
EXPERIENCE	0-7	6	7			7	6	7										5	7	5	6
ATTACHM'T	0-4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2	2	2	2

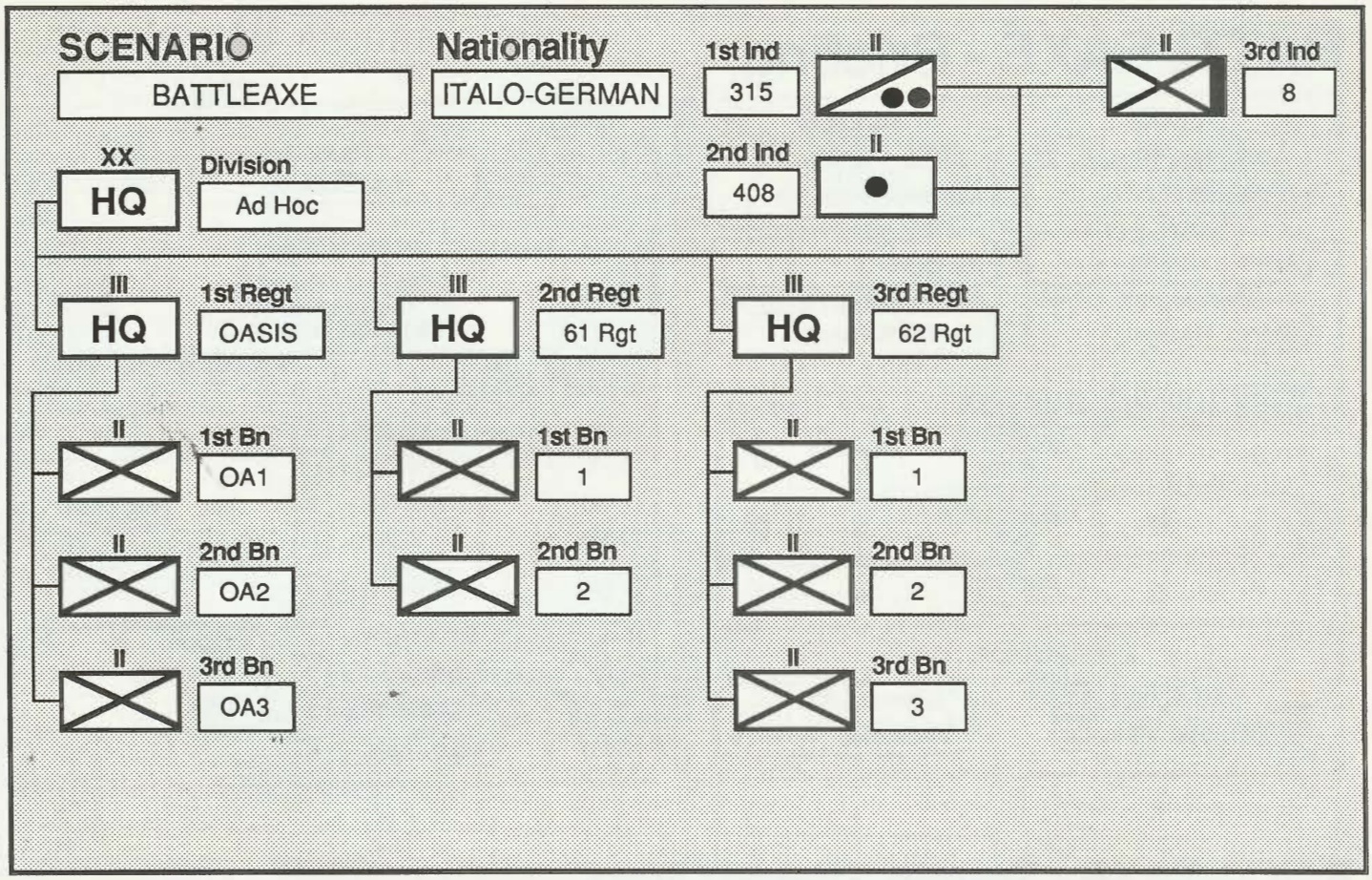


HEADQUARTERS DATA

FORMATION		XX HQ	1/RHQ	2/RHQ	3/RHQ	4/RHQ
HQ I.D.	[8]	5 Lt Div	5Pz Rgt	125 Rgt	192 Rgt	
UNIT TYPE	[8]	Pz Gren	Panzer	Pz Gren	Pz Gren	
HQ ADMIN	0-7	5	7	5	5	
LEADERSHIP	0-7	6	7	5	5	
HQ SUPPLY	0-7	5	6	5	5	
MOVEMENT	0-31	6	N/A	N/A	N/A	N/A
ARRIVAL	0-63	7	N/A	N/A	N/A	N/A
LOCATION	(x,y)	10,20	N/A	N/A	N/A	N/A

BATTALION DATA

FORMATION	II/III	1/1	2/1	3/1	4/1	1/2	2/2	3/2	4/2	1/3	2/3	3/3	4/3	1/4	2/4	3/4	4/4	1/-	2/-	3/-	4/-
UNIT I.D.	[3]	1	2			1	2	3		1	2	3						21	155	106	Mnt
LOCATION	(x,y)	0,10	0,10			10,20	10,20	10,20		10,20	10,20	10,20						0,10	0,10	0,10	10,20
CLASS	0-13	11	11			1	1	1		1	1	1						11	13	9	6
MODE	0-3	0	0			0	0	0		0	0	0						0	0	0	0
EQUIPM'T	0-31	11	12			18	18	18		18	18	18						15	14	10	13
MOVEMENT	0-31	11	10			14	14	14		14	14	14						12	8	8	18
STRENGTH	0-15	8	6			6	5	5		6	5	5						8	4	5	4
RATING	0-15	9	10			8	8	8		8	8	8						8	10	7	8
RANGE	0-15	1	0			0	0	1		0	0	1						1	3	2	0
ARRIVAL	0-63	5	5			8	8	8		9	9	9						5	6	6	7
FATIGUE	0-7	6	6			6	6	6		6	6	6						6	6	6	6
EXPERIENCE	0-7	6	7			5	5	5		5	5	5						5	4	4	5
ATTACHM'T	0-4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	1	1	2



HEADQUARTERS DATA

FORMATION		XX HQ	1/RHQ	2/RHQ	3/RHQ	4/RHQ
HQ I.D.	[8]	Ad Hoc	OASIS	61lt Rgt	62lt Rgt	
UNIT TYPE	[8]	Infantry	Garrison	Infantry	Infantry	
HQ ADMIN	0-7	5	4	5	5	
LEADERSHIP	0-7	6	5	4	4	
HQ SUPPLY	0-7	4	4	4	4	
MOVEMENT	0-31	6	N/A	N/A	N/A	N/A
ARRIVAL	0-63	3	N/A	N/A	N/A	N/A
LOCATION	(x,y)	0,5	N/A	N/A	N/A	N/A

BATTALION DATA

FORMATION	II/III	1/1	2/1	3/1	4/1	1/2	2/2	3/2	4/2	1/3	2/3	3/3	4/3	1/4	2/4	3/4	4/4	1/-	2/-	3/-	4/-
UNIT I.D.	[3]	OA1	OA2	OA3		1	2			1	2	3						315	408	8	
LOCATION	(x,y)	10,11	14,9	13,12		12,10	16,8			9,2	9,5	9,4						11,9	12,9	8,5	
CLASS	0-13	0	0	0		0	0			0	0	0						6	13	4	
MODE	0-3	0	0	0		0	0			0	0	0						0	0	0	
EQUIPM'T	0-31	1	1	1		1	1			1	1	1						13	14	7	
MOVEMENT	0-31	4	4	4		4	4			4	4	4						14	5	8	
STRENGTH	0-15	2	3	1		3	6			3	6	3						3	4	8	
RATING	0-15	8	8	8		4	4			4	4	4						6	10	8	
RANGE	0-15	0	0	0		0	0			0	0	0						0	3	1	
ARRIVAL	0-63	0	0	0		0	0			0	0	0						0	0	0	
FATIGUE	0-7	3	3	3		3	3			3	3	3						3	4	6	
EXPERIENCE	0-7	5	6	5		3	3			3	3	3						4	6	5	
ATTACHM'T	0-4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	2	3	

BATTLEAXE - Briefing

AXIS	ALLIED
SIDE [16]: GERMANY/ITALY	SIDE [16]: COMMONWEALTH
CORPS [16]: AFRIKA KORPS	CORPS [16]: XIII CORPS
COMMANDER [16]: General Rommel	COMMANDER [16]: Gen Ber'd-Peirse

DAY	NIGHT	SUPPORT	DAY	NIGHT
8	0	QUANTITY (0-99)	12	0
1	0	RELIABILITY (0-3)	2	0
5	0	RATING (0-15)	6	0

AIR SUPERIORITY (0-7)

STATUS = 4
RELIABILITY = 2

WEAK ALLIED
VARIABLE

SCENARIO [16]: BATTLEAXE

BRIEFING [26]: The First Attempt to Capture Tobruk 15th - 18th June, 1941

START DATA

(0-3)	START = 0	
(1-31)	DATE = 15	am 15th JUN 1941
(1-12)	MONTH = 6	
(0-63)	YEAR = 41	
(1-16)	LENGTH = 4	
(0-3)	WEATHER = 3	CLEAR
(0-7)	FORECAST = 7	CLEARING
	CLIMATE = 3	ARID
(0-31)	MECH MIN = 6	

BATTLEAXE - Terrain Effects Chart

TERRAIN CODE (T0-T15)	TERRAIN NAME [10]	TERRAIN COSTS PER HEX		ATTACK EFFECTS		
		MECH (0-31)	NON-MECH (0-31)	ARM (0-7)	ART (0-7)	INF (0-7)
T0	OCEAN	0	0	0	0	0
T1(RET)	CLEAR	2	1	7	7	6
T2	SLOPE	3	2	6	5	5
T3	SAND	4	2	5	4	3
T4	-	-	-	-	-	-
T5	ROUGH	5	2	4	4	3
T6	-	-	-	-	-	-
T7	MARSH	0	0	0	0	0
T8	-	-	-	-	-	-
T9	-	-	-	-	-	-
T10	ESCARPMENT	0	0	4	4	2
T11	PASS	8	3	4	2	1
T12	-	-	-	-	-	-
T13	-	-	-	-	-	-
T14	HILL	6	3	3	3	2
T15	-	-	-	-	-	-
-	ROAD	1	1	N.A.	N.A.	N.A.
-	FORT	N.A.	N.A.	3	3	2
-	TOWN	N.A.	N.A.	4	5	4
-	BRIDGE	0	0	0	0	0
-	RIVER	N.A.	0	0	0	0

BATTLEAXE - Objectives

I.D. (1-24)	NAME [11]	MAP LOC [x,y]	START (0-63)	END (0-63)	POINTS PER TURN (0-30)	POINTS AT END (0-255)
1(AX)	Sidi Aziez	5,8	1	15	1	10
2(AX)	Bardia	9,2	1	15	1	10
3(AX)	Point 204	9,18	10	15	1	5
4(AX)	Point 208	10,11	1	15	1	10
5(AX)	Capuzzo	12,10	1	15	2	20
6(AX)	Point 206	13,12	1	15	1	10
7(AX)	Sollum	16,8	1	15	3	20
8(AX)	Sidi Sulmen	16,14	9	15	3	30
9(AX)	HalfayaPass	17,9	1	15	5	50
10(AX)	Buq Buq	26,5	11	15	8	80
11(AX)	Hlfy House	26,13	11	15	2	20
12(AX)	Sidi Barani	33,0	12	15	20	200
1(AL)	Sidi Aziez	5,8	5	15	10	100
2(AL)	Bardia	9,2	5	15	20	200
3(AL)	Point 204	9,18	5	15	2	20
4(AL)	Point 208	10,11	1	15	4	40
5(AL)	Capuzzo	12,10	1	15	5	40
6(AL)	Point 206	13,12	1	15	2	25
7(AL)	Musaid	14,9	1	15	4	40
8(AL)	Sollum	16,8	5	15	5	50
9(AL)	HalfayaPass	17,9	1	15	10	80
10(AL)	Buq Buq	26,5	1	15	5	20
11(AL)	Sofafi	32,12	1	15	2	30
12(AL)	Sidi Barani	33,0	1	15	1	10

BATTLEAXE - Miscellaneous Factors

ADJACENT ENEMY HEX PENALTY (0-15)

1st HEX =	1	4th HEX =	3
2nd HEX =	2	5th HEX =	3
3rd HEX =	3	6th HEX =	3

VICTORY POINTS PER STRENGTH POINT LOST (0-15)

	MECH	NON MECH
AXIS	5	3
ALLIED	3	2

MAP SIZE

ACROSS (0-2)	2
DOWN (0-3)	2

Continued on p.48

SEALION 1941

A Scenario for the *Battlefront Game System*

by Ian Trout

On the night of July 4th, 1941, advance elements of VII Fleiger Korps dropped onto English soil. The Battle for England had begun. . .

ALTERNATIVE HISTORY

The Battle of France in 1940 was over long before the German High Command predicted it would be. There were no serious plans for an invasion of England; indeed, there were many who expected a speedy Armistice. A hurried attempt was made to mount an airborne/amphibious attack in the last days of summer but a combination of British airpower, bad weather and good sense stayed its execution.

What could have happened had Germany decided on a 1941 campaign against England? With hindsight, of course, the value of avoiding a two-front war cannot be overstated. Did Germany possess the capability (or could it have been developed in the winter of 1940) to invade and conquer England? It's hard to be certain but given the wretched condition of British land forces, their abysmal performance in North Africa in 1941 and the known expertise of their adversaries, it seems to this author that once ashore it would have been only a matter of time before Britain was defeated.

A more difficult question is whether the Germans could have held off the RAF and RN long enough to secure a safe landing area. I'm still undecided on this but for the purpose of this scenario, we'll assume the Germans are going to try.

THE SCENARIO

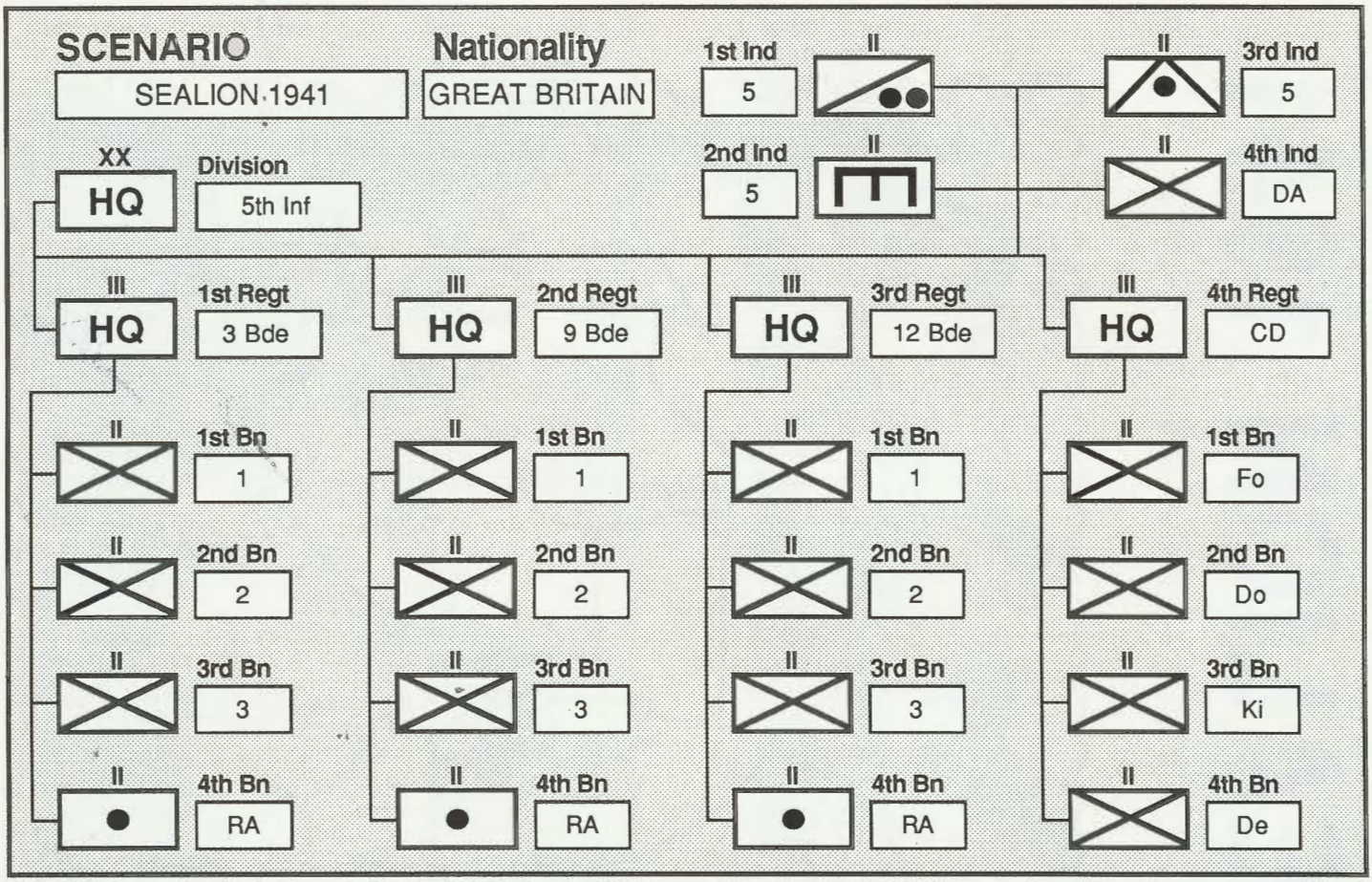
The broad picture in which this scenario is set postulates a German invasion spear-headed by two reinforced airborne divisions and backed up by three divisions and several diversionary groups landing by amphibious transport. The target areas run from Southampton to Ramsgate. Ports and airstrips must be captured, and quickly before the impetous of the invaders is lost.

In the small part of southeast England covered by this scenario, the Germans have one airborne division and one composite division with which to capture Dover and Folkestone (and hopefully Kingsdown and Deal) as well as the airfields at Hawkinge, Swingfield and Lyminge. Effectively, they have five days to do the job.

SEALION 1941

Terrain Key

OCEAN	DOWNS	MUD FLATS	MARSH	WOODS
AIRFIELD	ORCHARD	CLIFFS	COASTAL	RIVER
HILLY	MINEFIELD	ROAD	TOWN	BRIDGE

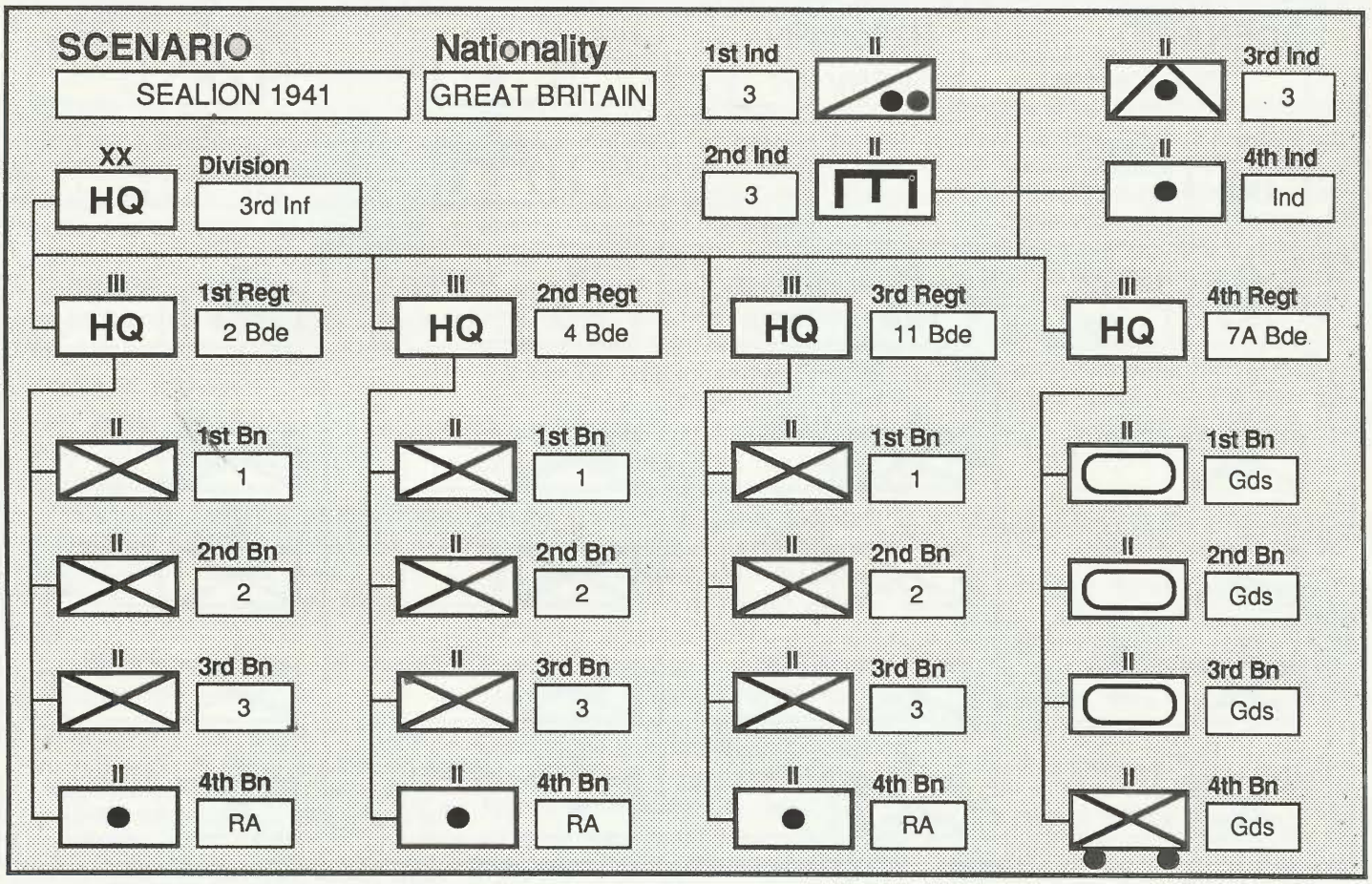


HEADQUARTERS DATA

FORMATION		XX HQ	1/RHQ	2/RHQ	3/RHQ	4/RHQ
HQ I.D.	[8]	5th Inf	3 Bde	9 Bde	12 Bde	CD
UNIT TYPE	[8]	Infantry	Infantry	Infantry	Infantry	Garrison
HQ ADMIN	0-7	5	7	7	7	7
LEADERSHIP	0-7	5	4	3	3	2
HQ SUPPLY	0-7	6	7	7	7	7
MOVEMENT	0-31	12	N/A	N/A	N/A	N/A
ARRIVAL	0-63	4	N/A	N/A	N/A	N/A
LOCATION	(x,y)	8,9	N/A	N/A	N/A	N/A

BATTALION DATA

FORMATION	II/III	1/1	2/1	3/1	4/1	1/2	2/2	3/2	4/2	1/3	2/3	3/3	4/3	1/4	2/4	3/4	4/4	1/-	2/-	3/-	4/-
UNIT I.D.	[3]	1	2	3	RA	1	2	3	RA	1	2	3	RA	Fo	Do	Ki	De	5	5	5	DA
LOCATION	(x,y)	7,22	6,22	6,20	5,20	15,6	15,7	16,7	14,7	4,13	5,12	6,13	5,11	8,25	16,20	22,13	22,9	3,26	14,6	0,26	9,9
CLASS	0-13	0	0	0	13	0	0	0	13	0	0	0	13	0	0	0	0	6	7	9	0
MODE	0-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EQUIPM'T	0-31	3	3	3	14	3	3	3	14	3	3	3	14	20	20	20	20	7	6	10	4
MOVEMENT	0-31	9	9	9	12	9	9	9	12	9	9	9	12	0	0	0	0	20	9	12	4
STRENGTH	0-15	12	12	12	4	12	12	12	4	12	12	12	4	9	12	3	7	6	12	9	6
RATING	0-15	8	8	8	11	8	8	8	11	8	8	8	11	6	6	6	6	7	10	9	3
RANGE	0-15	0	0	1	12	0	0	1	12	0	0	1	12	0	0	0	0	0	0	1	0
ARRIVAL	0-63	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	9
FATIGUE	0-7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
EXPERIENCE	0-7	5	5	5	5	4	4	4	4	4	4	4	4	2	2	2	2	6	5	5	0
ATTACHM'T	0-4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	2	3	1

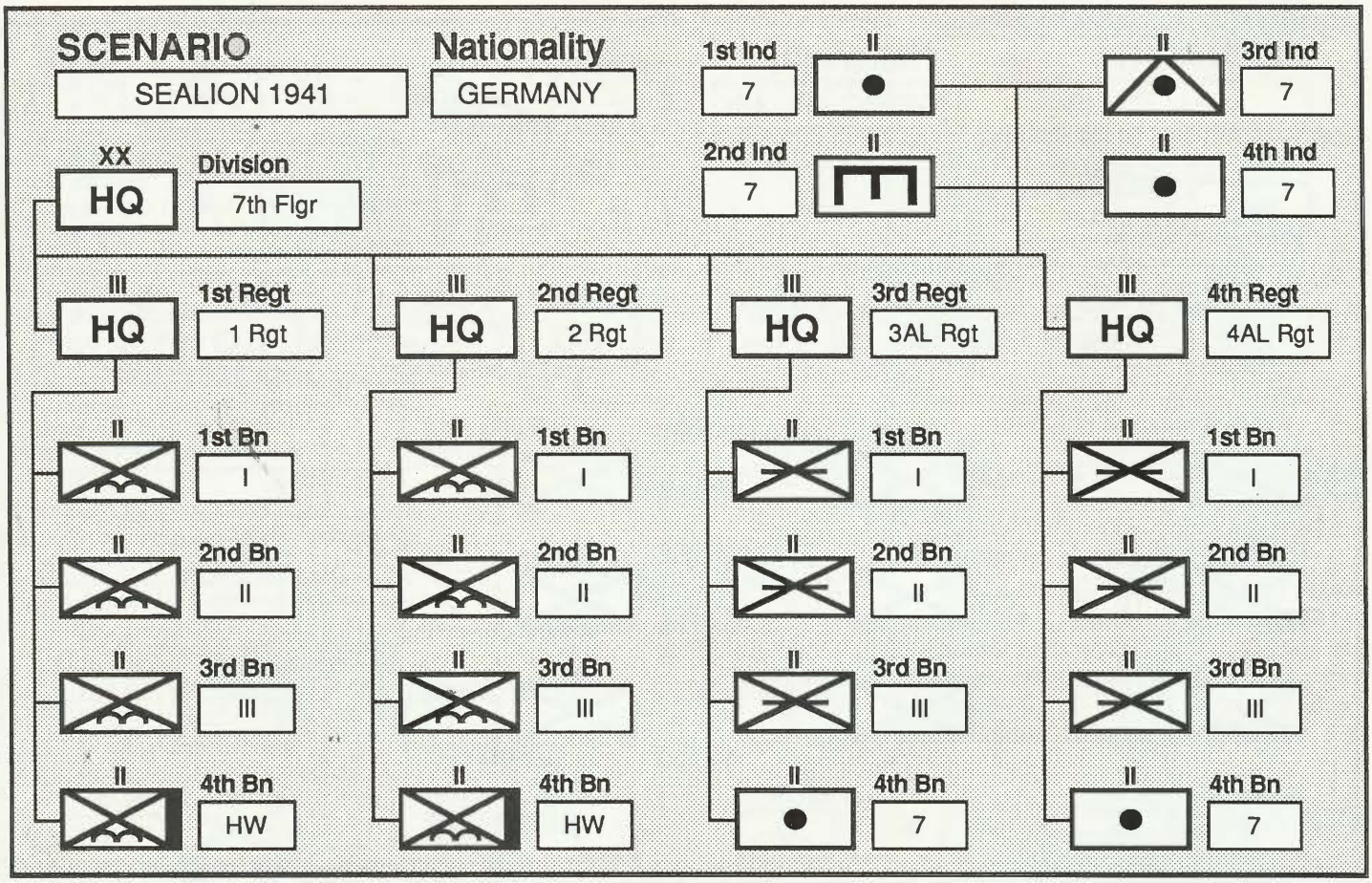


HEADQUARTERS DATA

FORMATION		XX HQ	1/RHQ	2/RHQ	3/RHQ	4/RHQ
HQ I.D.	[8]	3rd Inf	2 Bde	4 Bde	11 Bde	7A Bde
UNIT TYPE	[8]	Infantry	Infantry	Infantry	Infantry	Armour
HQ ADMIN	0-7	5	7	7	7	7
LEADERSHIP	0-7	3	2	5	3	4
HQ SUPPLY	0-7	6	7	7	7	7
MOVEMENT	0-31	12	N/A	N/A	N/A	N/A
ARRIVAL	0-63	6	N/A	N/A	N/A	N/A
LOCATION	(x,y)	1,3	N/A	N/A	N/A	N/A

BATTALION DATA

FORMATION	II/III	1/1	2/1	3/1	4/1	1/2	2/2	3/2	4/2	1/3	2/3	3/3	4/3	1/4	2/4	3/4	4/4	1/-	2/-	3/-	4/-
UNIT I.D.	[3]	1	2	3	RA	1	2	3	RA	1	2	3	RA	Gds	Gds	Gds	Gds	3	3	3	Ind
LOCATION	(x,y)	1,4	1,4	1,4	1,4	1,4	1,4	1,4	1,4	18,0	18,0	18,0	18,0	1,4	1,4	1,4	1,4	1,4	1,4	1,4	1,4
CLASS	0-13	0	0	0	13	0	0	0	13	0	0	0	13	11	11	11	1	6	7	9	13
MODE	0-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EQUIPM'T	0-31	3	3	3	14	3	3	3	14	3	3	3	14	16	17	17	7	9	6	10	19
MOVEMENT	0-31	9	9	9	12	9	9	9	12	9	9	9	12	2	16	16	12	20	9	12	12
STRENGTH	0-15	12	12	12	4	12	12	12	4	12	12	12	4	8	9	9	9	8	12	9	6
RATING	0-15	8	8	8	11	8	8	8	11	8	8	8	11	5	3	3	9	7	10	9	15
RANGE	0-15	0	0	1	12	0	0	1	12	0	0	1	12	1	0	0	0	0	0	1	15
ARRIVAL	0-63	17	17	17	17	11	11	11	11	5	5	5	5	7	9	12	9	8	10	12	12
FATIGUE	0-7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
EXPERIENCE	0-7	4	4	4	4	3	3	3	3	4	4	4	4	5	5	5	5	4	4	3	4
ATTACHM'T	0-4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4	4	4	4

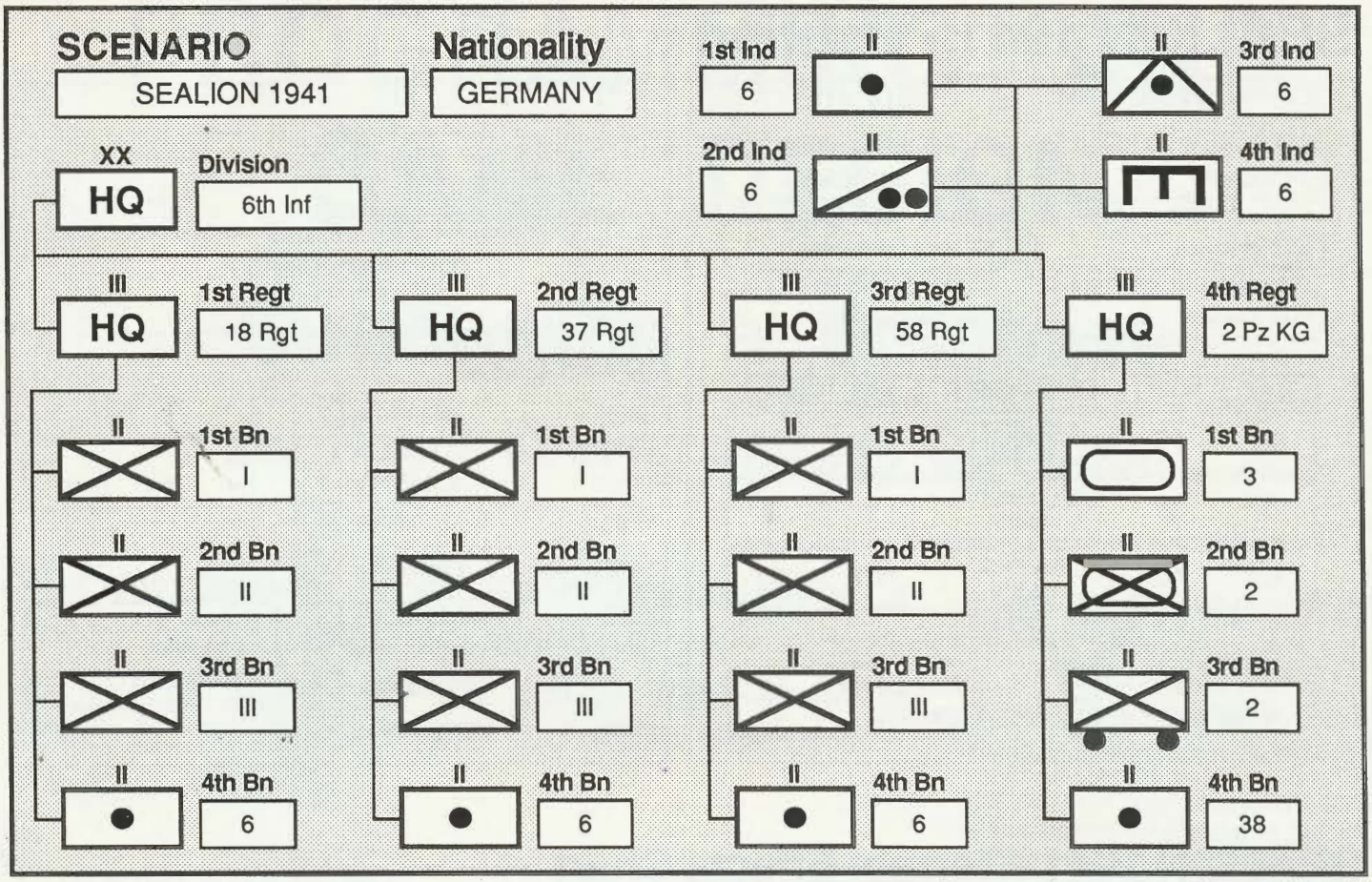


HEADQUARTERS DATA

FORMATION		XX HQ	1/RHQ	2/RHQ	3/RHQ	4/RHQ
HQ I.D.	[8]	7th Flgr	1 Rgt	2 Rgt	3AL Rgt	4AL Rgt
UNIT TYPE	[8]	Airborne	Airborne	Airborne	Airborne	Airborne
HQ ADMIN	0-7	4	7	7	7	7
LEADERSHIP	0-7	7	7	7	6	6
HQ SUPPLY	0-7	4	7	7	7	7
MOVEMENT	0-31	3	N/A	N/A	N/A	N/A
ARRIVAL	0-63	4	N/A	N/A	N/A	N/A
LOCATION	(x,y)	18,15	N/A	N/A	N/A	N/A

BATTALION DATA

FORMATION	II/III	1/1	2/1	3/1	4/1	1/2	2/2	3/2	4/2	1/3	2/3	3/3	4/3	1/4	2/4	3/4	4/4	1/-	2/-	3/-	4/-
UNIT I.D.	[3]	I	II	III	HW	I	II	III	HW	I	II	III	HW	I	II	III	7	7	7	7	7
LOCATION	(x,y)	11,20	10,18	10,15	12,18	18,13	20,14	17,13	19,11	10,20	10,20	10,20	10,20	10,21	10,21	10,21	10,21	10,17	9,16	11,21	11,21
CLASS	0-13	3	3	3	4	3	3	3	4	0	0	0	13	0	0	0	13	13	7	9	13
MODE	0-3	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	1	2	2
EQUIPM'T	0-31	1	1	1	11	1	1	1	11	1	1	1	12	1	1	1	12	12	6	10	13
MOVEMENT	0-31	6	6	6	6	6	6	6	6	8	8	8	8	8	8	8	6	4	6	6	4
STRENGTH	0-15	10	10	10	6	10	10	10	6	12	12	12	3	12	12	12	3	3	10	6	3
RATING	0-15	6	6	6	8	6	6	6	8	9	9	9	10	9	9	9	10	10	8	8	12
RANGE	0-15	0	0	0	1	0	0	0	1	0	0	1	10	0	0	1	10	10	0	1	14
ARRIVAL	0-63	4	4	4	4	4	4	4	4	7	9	10	13	7	9	10	13	4	4	11	15
FATIGUE	0-7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
EXPERIENCE	0-7	7	7	7	7	7	6	7	6	6	6	5	5	7	6	5	6	6	7	5	6
ATTACHM'T	0-4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	1	3	3



HEADQUARTERS DATA

FORMATION		XX HQ	1/RHQ	2/RHQ	3/RHQ	4/RHQ
HQ I.D.	[8]	6th Inf	18 Rgt	37 Rgt	58 Rgt	2 Pz KG
UNIT TYPE	[8]	Infantry	Infantry	Infantry	Infantry	Panzer
HQ ADMIN	0-7	4	7	7	7	7
LEADERSHIP	0-7	6	6	5	6	7
HQ SUPPLY	0-7	5	7	7	7	7
MOVEMENT	0-31	6	N/A	N/A	N/A	N/A
ARRIVAL	0-63	6	N/A	N/A	N/A	N/A
LOCATION	(x,y)	15,22	N/A	N/A	N/A	N/A

BATTALION DATA

FORMATION	II/III	1/1	2/1	3/1	4/1	1/2	2/2	3/2	4/2	1/3	2/3	3/3	4/3	1/4	2/4	3/4	4/4	1/-	2/-	3/-	4/-
UNIT I.D.	[3]	I	II	III	6	I	II	III	6	I	II	III	6	3	2	2	38	6	6	6	6
LOCATION	(x,y)	11,23	12,23	12,23	11,23	13,23	11,23	14,23	12,23	14,23	13,23	14,23	13,23	17,20	17,20	17,20	17,20	12,23	13,23	12,23	12,23
CLASS	0-13	0	0	0	13	0	0	0	13	0	0	0	13	11	2	1	13	13	6	9	7
MODE	0-3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
EQUIPM'T	0-31	2	2	2	13	2	2	2	13	2	2	2	13	15	5	5	13	18	9	10	6
MOVEMENT	0-31	8	8	8	6	8	8	8	6	8	8	8	6	12	12	12	12	4	16	6	8
STRENGTH	0-15	12	12	12	4	12	12	12	4	12	12	12	4	9	9	9	3	4	9	6	12
RATING	0-15	9	9	9	12	9	9	9	12	9	9	9	12	8	6	9	12	13	8	8	10
RANGE	0-15	0	0	1	14	0	0	1	14	0	0	1	14	1	0	0	14	15	0	1	0
ARRIVAL	0-63	5	5	7	7	9	9	9	9	5	5	7	7	16	15	15	17	11	7	10	7
FATIGUE	0-7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
EXPERIENCE	0-7	6	6	6	6	6	6	6	6	6	6	6	6	7	7	7	7	6	6	6	6
ATTACHM'T	0-4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	3	3	2

SEALION 1941 - Briefing

AXIS	ALLIED
SIDE [16]: GERMANY	SIDE [16]: GREAT BRITAIN
CORPS [16]: VII Flgr Korps	CORPS [16]: SE Area Command
COMMANDER [16]: Gen Student	COMMANDER [16]: Gen Montgomery

DAY	NIGHT	SUPPORT	DAY	NIGHT
45	15	QUANTITY (0-99)	35	20
1	2	RELIABILITY (0-3)	1	2
12	12	RATING (0-15)	10	10

AIR SUPERIORITY (0-7)

STATUS = 3
RELIABILITY = 0

WEAK AXIS
ERRATIC

SCENARIO [16]: SEALION 1941

BRIEFING [26]: The Invasion of England 4th - 9th July, 1941

START DATA

(0-3)	START =	3
(1-31)	DATE =	4
(1-12)	MONTH =	7
(0-63)	YEAR =	41
(1-16)	LENGTH =	6
(0-3)	WEATHER =	3
(0-7)	FORECAST =	7
	CLIMATE =	0
(0-31)	MECH MIN =	12

nite 4th JUL 1941

CLEAR
CLEARING
EUROPEAN

SEALION 1941 - Terrain Effects Chart

TERRAIN CODE (T0-T15)	TERRAIN NAME [10]	TERRAIN COSTS PER HEX		ATTACK EFFECTS		
		MECH (0-31)	NON-MECH (0-31)	ARM (0-7)	ART (0-7)	INF (0-7)
T0	OCEAN	0	0	0	0	0
T1(RET)	DOWNS	3	2	6	7	7
T2	WOODS	4	2	6	6	7
T3	HILLY	4	2	4	6	5
T4	-	-	-	-	-	-
T5	-	-	-	-	-	-
T6	MARSH	0	8	2	4	4
T7	COASTAL	2	2	6	6	6
T8	AIRFIELD	2	2	6	6	6
T9	-	-	-	-	-	-
T10	CLIFF	0	0	0	0	0
T11	MUD FLAT	0	8	2	5	5
T12	ORCHARD	3	2	5	6	6
T13	-	-	-	-	-	-
T14	-	-	-	-	-	-
T15	-	-	-	-	-	-
-	ROAD	2	1	N.A.	N.A.	N.A.
-	FORT	N.A.	N.A.	3	3	4
-	TOWN	N.A.	N.A.	4	4	5
-	BRIDGE	1	1	5	7	5
-	RIVER	N.A.	3	4	7	4

SEALION 1941 - Objectives

I.D. (1-24)	NAME [11]	MAP LOC [x,y]	START (0-63)	END (0-63)	POINTS PER TURN (0-30)	POINTS AT END (0-255)
1(AX)	Lympne	0,26	4	23	2	50
2(AX)	Hythe	2,27	4	23	3	50
3(AX)	Folkestone	8,25	4	23	5	100
4(AX)	Hawkinge AF	7,22	4	23	10	50
5(AX)	Swingfield	6,19	4	23	2	50
6(AX)	Dover	16,20	4	23	10	150
7(AX)	Kingsdown	22,13	4	23	5	50
8(AX)	Deal	22,9	4	23	5	75
9(AX)	Aylesham	8,9	4	23	2	50
10(AX)	Eastry	15,6	4	23	1	50
11(AX)	Barham	5,12	4	23	1	50
12(AX)	Sandwich	17,4	4	23	1	75
1(AL)	Deal	22,9	4	23	3	25
2(AL)	Kingsdown	22,13	4	23	2	25
3(AL)	Dover	16,20	4	23	5	200
4(AL)	Folkestone	8,25	4	23	5	150
5(AL)	Hythe	2,27	4	23	3	25
6(AL)	Hawkinge AF	7,22	4	23	5	25
7(AL)	Lympne	0,26	4	23	1	25
8(AL)	Swingfield	6,19	4	23	2	25
9(AL)	Lydden	11,16	4	23	2	25
10(AL)	Whitfield	15,16	4	23	2	25
11(AL)	Ringwould	20,13	4	23	2	25
12(AL)	-	-	-	-	-	-

SEALION 1941 - Miscellaneous Factors

ADJACENT ENEMY HEX PENALTY (0-15)

1st HEX =	1	4th HEX =	4
2nd HEX =	1	5th HEX =	4
3rd HEX =	2	6th HEX =	4

VICTORY POINTS PER STRENGTH POINT LOST (0-15)

	MECH	NON MECH
AXIS	4	2
ALLIED	4	1

MAP SIZE

ACROSS (0-2)	1
DOWN (0-3)	3

EUROPE ABLAZE

Technical Data on Plane Types

PART THREE

American and French Aircraft of World War II

*In this chapter of our **Europe Ablaze** technical feature, American and French aircraft are described and formatted. All production types as well as many of the more interesting development types are included.*

Part Four in the next issue will conclude the feature with an evaluation of Commonwealth, Russian and minor Allied aircraft.

AMERICAN AIRCRAFT DESIGNATIONS

At the time of American entry into the Second World War, US air forces operated as separate appendages of the US Army and the US Navy. Of other contemporary major powers, only Japan organized her air forces in this way.

Germany, the Commonwealth, France, Italy and Russia operated their air forces as an independent service. It was not until 1947 that US Army and Navy air forces were amalgamated as the USAF.

The designation systems used by the Army and Navy were different; another parallel with Japan, but fortunately only one system was in operation for each.

The US Army Air Force

The basic designation structure consisted of two characters, the first being a letter which described the function of the aircraft and the second a numeral to identify the particular model. For example, the B-24 is the 24th bomber aircraft authorized by the USAAF.

Some of the more common function codes were **A** (Attack), **AT** (Advanced Trainer), **B** (Bomber), **BT** (Basic Trainer), **C** (Cargo), **F** (Photographic), **FM** (Fighter, multi-purpose), **L** (Liason), **O** (Observation), and **P** (Pursuit).

An X prefix (e.g. XP-40) specified an experimental prototype; a Y prefix specified a batch of aircraft ordered for service trials or evaluation.

Suffixes were used to identify successive variants of a particular type. For example, the P-51D is the fourth production model of the Mustang.

A 'block' number and a Manufacturer's Code could be added to the basic designation to provide a more precise identification of individual aircraft. For example, B-24H-10-CF identifies the Liberator as being in the third production block (-10) built by Consolidated at Fort Worth.

The US Navy

The US Navy designation system, which covered Marine Corps aircraft as well, was comprised of four major components. These were a function code, a manufacturer's sequence numeral, a manufacturer's ID code and a variant numeral.

For example, the code SB2U-3 tells us that the Vindicator is a scout-bomber, the second of that type built by Chance Vought and that it is the third production variant. Note that the manufacturer's sequence numeral is omitted for the first aircraft of that type produced; i.e. SBD Dauntless, not SB1D.

Major function codes were **B** (Bomber), **BT** (Bomber-Torpedo), **F** (Fighter), **G** (Transport), **N** (Trainer), **O** (Observation), **P** (Patrol), **PB** (Patrol-Bomber), **SB** (Scout Bomber), **TB** (Torpedo-Bomber).

An X prefix identified an experimental prototype while a range of suffix codes were in use to describe minor modifications which did not justify a separate variant number. For example, F6F-3N tells us that this Grumman Hellcat was modified for night fighting duties.

Other Aircraft

In addition to supplying her own air forces, the US aircraft industry produced a large number of aircraft for foreign air forces. Most of these aircraft types eventually saw some kind of service with US forces; those

that didn't have the manufacturer's private designation.

AIRCRAFT NOTES

The following notes are intended to give a brief summary of operational histories as well as to identify the more important modifications made to major aircraft types. The arrangement in this section corresponds to the order in the tables overleaf.

United States Aircraft

A number of aircraft types served both with the Army and Navy. In these cases, the designation used is that of the branch first ordering the aircraft.

P-39 (AIRACOBRA). Single engine fighter. Specifically designed to employ a 37mm cannon. Entered service early 1942 but problems with in-line engine and maintenance troubles restricted its use once alternative fighters were available. The bulk of major variant production went to the USSR under the provisions of the Lend-Lease scheme. Other countries to use the P-39 were Great Britain, France (after 1944) and Italy (after 1943).

P-59 (AIRACOMET). Twin engine jet fighter. The first jet aircraft designed in America, the P-59 first flew in Aug 1943 but because of teething troubles and extended flight testing, never saw front-line service. Employed as an operational trainer until 1946.

P-63 (KING COBRA). Single engine fighter. A development of the Airacobra, the P-63 entered service in mid 1943. The availability of superior fighters such as the Thunderbolt and Mustang prevented its operational use by US forces. Some 80% of total production went to the USSR with the remainder going to the FFAF.

B-17 (FLYING FORTRESS). Four engine heavy bomber. The first production variants of this superior design entered service mid 1940 and although early versions were under-armed and short ranged, they gave a good account of themselves. Used extensively in Europe and the Pacific, finally spear-heading the 8th Air Force's strategic offensive against German industrial capacity. Undoubtedly the toughest bomber to see action in Europe.

B-29 (SUPERFORTRESS). Four engine very heavy bomber. Entered service in June 1944, attacking Japanese territory in Burma and China as well as the mainland itself. It was the first military aircraft to provide pressurized accommodation for all crew members. Operated extensively from the Marianas Islands against the Japanese homeland, finally delivering the atomic *coup de grace* in Aug 1945.

F2A-3 (BUFFALO). Single engine fighter. Entered service with the USN in May 1940 and was the principal carrier fighter until late 1941. Performed poorly against Japanese fighters and withdrawn from service by mid 1942. Saw action under Dutch colours in the Far East and Finnish colours in the Winter war of 1939-40.

SB2A (BUCCANEER). Single engine attack bomber. Entered service 1942 but mediocre performance led to its rejection for operational use both by the USN and the RAF. British versions (Bermudas) adapted for target towing while USN aircraft served as advanced trainers.

PBY (CATALINA). Twin engine maritime reconnaissance flying boat. Entered service 1936 and saw action throughout the war in the Pacific theatre in patrol, ASW, rescue and transport roles. Used extensively by the RAF for ASW duty in the Atlantic. Used also by Canadian, Australian and Russian forces.

PB2Y (CORONADO). Four engine maritime reconnaissance flying boat. A larger development of the Catalina, the PB2Y entered service 1942 and saw action in recon, ASW and transport roles.

B-24 (LIBERATOR). Four engine heavy bomber. Originally intended as a replacement for the B-17. Entered service in 1942 but performance was inferior to the B-17 in all but range. Became the major heavy bomber in the Pacific theatre until the advent of the B-29 while the B-17 continued as the mainstay of the European bombing offensive. Later modifications included photographic, training and transport versions as well as the nearly 1,000 aircraft employed by the USN in ASW duties under the designation PB4Y-1.

PB4Y (PRIVATEER). Four engine maritime patrol bomber. A development of the B-24, the PB4Y-2 entered service 1944 and saw limited action in the Pacific in its intended patrol bomber role. Some ASW and transport duties were also performed.

B-32 (TERMINATOR). Four engine very heavy bomber. Ordered into production in 1940 as a backup to the B-29, the B-32 became operational for a brief period in mid 1945, attacking Japan from the Marianas. More commonly known as the Dominator.

75A (HAWK). Single engine fighter. An export version of the P-36A, the Hawk entered service with the FAF in 1939 where it gave a good account of itself in the Battle of France. After the Armistice, outstanding orders went to Britain and saw action in Burma-India until 1944.

P-36 (MOHAWK). Single engine fighter. Entered service with the USAAF in 1940. Saw action at Pearl Harbour before being relegated to second-line and training duties shortly afterwards.

P-40 (WARHAWK). Single engine fighter. A development of the P-36, the P-40 entered service in 1941 and saw action on all fronts, equipping the air forces of ten nations by war's end. Supplanted by Thunderbolts and Mustangs in the last years of the war, the P-40 finally served in second-line and training roles.

SBC (HELLDIVER). Single engine biplane attack bomber. Entered service 1937 but saw no action in the war. Retired from US service early 1942. RAF versions used only for ground instruction.

SB2C (HELLDIVER). Single engine attack (dive) bomber. Entered service Dec 1942 as the replacement for the Dauntless. First saw action from a carrier deck in the attacks on Rabaul in 1943. By 1944 had become the mainstay of the carrier-borne dive bomber force, notwithstanding the preference of many pilots for the older SBD.

CW-21 (DEMON). Single engine fighter. Originally produced for the Chinese government, some 40 of these aircraft saw action in the Netherlands East Indies against the Japanese. Inadequate performance resulted in heavy losses. A two-seat trainer version was supplied to the US Navy as the SNC-1 Falcon.

A-20 (HAVOC/BOSTON). Twin engine medium bomber. Developed from the famous DB-7 bomber, the A-20 series entered US service in 1942 and served with distinction throughout the Pacific and European theatres. Export versions equipped Russian, French and Commonwealth air forces. The P-70 night fighter variant gave useful stop-gap service until the arrival of the purpose built P-61 Black Widow.

A-26 (INVADER). Twin engine medium bomber. Ordered as a replacement for the A-20, the A-26 entered service late 1944 seeing action in Europe and the Pacific. Later

AMERICAN AIRCRAFT OF WWII

NAME	[11]	Airacobra	Airacobra	Airacobra	Airacomet	King Cobra	King Cobra	Fortress	Fortress	Fortress	Superfort
DESIGNATION	or[11]	P-39D	P-39N	P-39Q	P-59B	P-63A	P-63C	B-17C	B-17F	B-17G	B-29
ROLE	0-3	0	0 (1)	0 (1)	0	0 (1)	0 (1)	2	2	2	2
CREW	0-7	1	1	1	1	1	1	7	7	7	7
FUEL	1-255	44	41	35	17	14	12	109	97	115	163
PAYLOAD	0-63	2	2	2	0	2 (6)	2 (6)	35	59	59	63
SERVICE CEIL.	11-41	32	39	35	41	41	39	36	37	36	32
MAX. SPEED	1-41	18	19	19	21	20	21	15	16	14	18
OPT. ALTITUDE	1-31	14	10	11	30	24	25	25	25	25	25
CRUIS. SPEED	1-31	11	11	11	19	19	18	12	11	9	12
CLIMB RATE	1-15	13	15	15	15	15	14	7	4	3	3
FIREPOWER	0-7	5	6	4	3	5	5	2	5	5	5
MANOEUVER.	0-7	4	4	4	5	4	4	2	1	1	0
VULNERABILITY	0-7	4	5	4	7	5	5	4	5	6	6
NIGHT	Y/N	N	N	N	N	N	N	N	N	N	N (Y)
TOT. PROD.	[#]	c. 1,620	c. 2,100	c. 4,900	c. 60	c. 1,750	c. 1,250	c. 110	c. 3,910	c. 8,600	c. 3,910

NAME	[11]	Buffalo	Buccaneer	Catalina	Catalina	Coronado	Liberator	Liberator	Liberator	Privateer	Terminator
DESIGNATION	or[11]	F2A-3	SB2A-2	PBY-3	PBY-5A	PB2Y-3	B-24A	B-24D	B-24H	PB4Y-2	B-32
ROLE	0-3	0	2 (3)	3	3	3	2	2	2	2	2
CREW	0-7	1	2	6	7	7	6	7	7	7	6
FUEL	1-255	46	54	217	252	147	115	158	107	200 (90)	100
PAYLOAD	0-63	0 (1)	4	5	14	27	29	43	43	25 (43)	63
SERVICE CEIL.	11-41	33	25	24	15	21	31	32	28	20	31
MAX. SPEED	1-41	16	14	10	9	11	15	15	15	12	18
OPT. ALTITUDE	1-31	17	12	12	7	20	15	25	25	14	30
CRUIS. SPEED	1-31	8	8	6	6	7	11	10	11	8	15
CLIMB RATE	1-15	11	10	5	3	3	9	5	4	5	3
FIREPOWER	0-7	4	3	1	2	4	3	4	5	5	4
MANOEUVER.	0-7	5	4	0	0	0	1	1	1	1	0
VULNERABILITY	0-7	3	3	2	3	5	4	5	5	6	4
NIGHT	Y/N	N	N	Y	Y	Y	N	N	N	N (Y)	N (Y)
TOT. PROD.	[#]	c. 510	c. 770	c. 220	c. 2,850	c. 230	c. 40	c. 2,700	c. 15,000	c. 740	c. 120

NAME	[11]	Hawk	Mohawk	Mohawk	Warhawk	Warhawk	Warhawk	Helldiver	Helldiver	Demon	Havoc
DESIGNATION	or[11]	75A	P-36A	P-36C	P-40C	P-40F	P-40N	SBC-4	SB2C-4	CW-21B	A-20G
ROLE	0-3	0	0	0	0	0 (1)	0 (1)	2	2	0	2
CREW	0-7	1	1	1	1	1	1	2	2	1	3
FUEL	1-255	42	33	30	31	17	15	59	82	27	47
PAYLOAD	0-63	0	0	0	0	2	5	4	4 (7)	0	14
SERVICE CEIL.	11-41	33	33	33	30	34	38	27	29	34	26
MAX. SPEED	1-41	15	15	15	17	18	19	12	15	16	17
OPT. ALTITUDE	1-31	19	10	14	15	20	11	15	17	12	12
CRUIS. SPEED	1-31	13	14	12	14	15	14	6	8	14	14
CLIMB RATE	1-15	11	14	15	14	10	11	9	9	15	7
FIREPOWER	0-7	2 (3) (4)	2	4	5	6	5	1	1 (3)	2	4
MANOEUVER.	0-7	5	5	5	5	5	5	6	5	6	3
VULNERABILITY	0-7	3	4	4	4	4	4	3	4	3	4
NIGHT	Y/N	N	N	N	N	N	N	N	N	N	N
TOT. PROD.	[#]	c. 820	c. 180	c. 60	c. 1,700	c. 4,490	c. 5,220	c. 350	c. 7,000	c. 70	c. 6,200

variants were used extensively in Korea and Vietnam.

B-18 (BOLO). Twin engine medium bomber. Entered service 1940 but saw little action after Pearl Harbour. An inferior type soon relegated to training and transport duties. Canadian aircraft (Digbys) used for convoy escort and ASW duty until 1943.

SBD (DAUNTLESS). Single engine attack (dive) bomber. Entered service in 1940 and was the principal carrier-borne dive bomber until 1943. It served with distinction throughout the Pacific, its greatest feat being the sinking of four Japanese carriers at Midway. Some aircraft saw service with the USAAF as land-based A-24s.

BTD (DESTROYER). Single engine attack (torpedo) bomber. Ordered as a multi-purpose carrier-borne bomber, a few BTDs entered service late 1944 but saw no action. The last variant became the prototype for the successful AD Skyraider.

TBD (DEVASTATOR). Single engine torpedo bomber. Entered service 1937 and was the USN's carrier-borne torpedo bomber on the outbreak of war. Very poor performance forced its early retirement as soon as sufficient TBF Avengers were available as replacements.

P-75 (EAGLE). Single engine high-altitude interceptor. Developed rapidly in 1943 using components from other aircraft already in service, the first flight trials in 1944 were disappointing. Production orders canceled soon after.

F4F (WILDCAT). Single engine fighter. The work-horse of the USN and Marine Corps in the Pacific, serving with distinction in carrier-borne and land-based roles from 1941 until the end of the war.

FF (GOBLIN). Single engine fighter. Although withdrawn from front-line US service in 1940, the Goblin saw some action in the Spanish Civil War, several aircraft surviving in Spanish service until 1950. Canadian versions used for training purposes.

F6F (HELLCAT). Single engine fighter. The replacement for the Wildcat, the F6F entered service aboard US fleet carriers in early 1943 and was the principal carrier fighter until the end of the war. Also served aboard British CVs.

F7F (TIGERCAT). Twin engine fighter bomber. Originally ordered as the USN's first twin engine carrier-borne bomber, the first production aircraft were delivered too late to see action. Served in a land-based role in the immediate post-war years.

TBF (AVENGER). Single engine torpedo bomber. Entered service mid 1942 and first saw action in the naval battles for Guadalcanal. Fought in every major naval or amphibious operation thereafter in the Pacific. Remained in front-line service throughout the war and in post-war years. Finally retired in 1957 as the longest serving USN aircraft at that time.

A-28 (HUDSON). Twin engine medium (light) bomber. Used principally by Britain and other Commonwealth countries as a patrol/ASW bomber, the Hudson saw action in the Atlantic and the Pacific. Only a few were used by the US; as PBO-1 patrol aircraft by the USN and as A-28/A-29 transport aircraft by the USAAF.

P-38 (LIGHTNING). Twin engine long range fighter or fighter bomber. Originally intended as a fast, high altitude interceptor, Lockheed chose to meet the requirement with the use of a twin boom airframe, the first of its type in US service. Teething troubles delayed delivery and the aircraft did not become operational until late 1942. Saw action in all theatres in both fighter and ground attack roles. Also served as the most widely used photo-reconnaissance aircraft in the USAAF.

P-80 (SHOOTING STAR). Single engine jet fighter. The second US jet to fly, the P-80 was sent to Europe for service trials in early 1945 but these were not completed prior to war's end. Saw some post-war service.

PV (VENTURA/HARPOON). Twin engine patrol bomber. Originally built to a British specification, the PV was found unsuitable for daylight European service and relegated to Coastal command duties. After 1941, the aircraft was used by the USAAF for over-water patrols in the Pacific using the name B-34. USN variants served in ASW role. Equipped all Commonwealth air forces before production ceased in 1944. The PV-2 (Harpoon) was an improved version with increased fuel capacity and armament.

167A (MARYLAND). Twin engine reconnaissance bomber. First ordered by France, only 70 were delivered before the Armistice. The remainder of the FAF order went to Britain and were used in North Africa, the Mediterranean and the Middle East. Some sent to South Africa. Did not see operational service with US forces.

A-30 (BALTIMORE). Twin engine attack (light) bomber. An improved version of the Maryland, the A-30 equipped several RAF squadrons in the Mediterranean seeing extensive service in North Africa and later in Sicily and Italy. Used in a transport role by the USAAF.

B-26 (MARAUDER). Twin engine medium bomber. Originally ordered in 1939, the B-26 did not enter service until 1942 because of training difficulties associated with its high landing speed. After modifications, the aircraft saw action in all theatres, being replaced in the Pacific in 1944 by B-25s. Also used for training, transport and photo-reconnaissance duties.

PBM (MARINER). Twin engine maritime reconnaissance flying boat. Entered service 1940 and used in conjunction with PBYs throughout the Pacific in patrol, ASW, and transport roles. One squadron employed by the RAF.

AT (HARVARD). Single engine advanced trainer or fighter. Used by the USAAF solely for training purposes and by other air forces in various roles. Licence built in Australia as the Wirraway, it engaged Japanese fighters on several occasions in early 1942, always disastrously.

B-25 (MITCHELL). Twin engine medium bomber. Entered service 1941 and saw action in every theatre until the end of the war. most notable exploit was the 'Doolittle' raid on Tokyo from the CV Yorktown in April 1942. Later, heavily armed versions were used extensively in Europe and the Mediterranean.

P-51 (MUSTANG). Single engine fighter. The most famous of all US fighters of WWII, the Mustang entered service with the USAAF in the Middle East in 1943. By war's end, Mustangs were employed in every theatre, earning a lethal reputation. They remained in service in post war years, being finally discarded in the fifties.

A-17 (NOMAD). Single engine attack (light) bomber. Entered service with the RAF in 1937 but poor performance resulted in their transfer to South Africa for target towing duty. Employed by China, Argentina, Peru and Holland in various roles. USAAF aircraft used solely for training.

P-61 (BLACK WIDOW). Twin engine night fighter. Entered service mid 1944 in the Pacific theatre and subsequently employed in Europe where because of the state of the war there was little for them to do. Used also as a trainer and in a reconnaissance role.

P-43 (LANCER). Single engine fighter. Unsuccessful forerunner to the acclaimed

AMERICAN AIRCRAFT OF WWII (Cont.)

NAME	[11]	Havoc	Havoc	Invader	Bolo	Dauntless	Dauntless	Destroyer	Devastator	Eagle	Wildcat
DESIGNATION	or[11]	A-20K	P-70	A-26B	B-18A	SBD-3	SBD-5	BTD-1	TBD-1	P-75A	F4F-4
ROLE	0-3	2	0	2	2	2	2	2	2	0	0
CREW	0-7	3	3	3	6	2	2	1	3	1	1
FUEL	1-255	45	45	60	79	70	75	90	43	50	57
PAYLOAD	0-63	14	0	20	22	5	8	11	4	0 (4)	1
SERVICE CEIL.	11-41	23	28	22	24	27	24	24	20	38	35
MAX. SPEED	1-41	16	16	19	11	13	13	17	10	20	16
OPT. ALTITUDE	1-31	11	14	10	10	16	14	16	8	20	19
CRUIS. SPEED	1-31	13	14	14	8	8	7	9	6	13	8
CLIMB RATE	1-15	6	10	6	5	6	9	8	4	15	10
FIREPOWER	0-7	4	6	5	1	2	3	2	1	7	6
MANOEUVER.	0-7	3	4	3	2	5	5	4	3	4	5
VULNERABILITY	0-7	5	4	5	3	4	5	5	3	4	4
NIGHT	Y/N	N	Y	N (Y)	N (Y)	N	N	N	N	N	N
TOT. PROD.	[#]	c. 700	c. 380	c. 2,450	c. 370	c. 1,510	c. 4,420	c. 30	c. 130	c. 10	c. 2,460

NAME	[11]	Wildcat	Goblin	Hellcat	Hellcat	Tigercat	Avenger	Avenger	Hudson	Lightning	Lightning
DESIGNATION	or[11]	FM-2	FF-2	F6F-3	F6F-5	F7F-3	TBF-1	TBM-3	A-28	P-38D	P-38G
ROLE	0-3	0	0	0	0	0 (1)	2	2	2	0	0
CREW	0-7	1	2	1	1	1 (2) (3)	3	3	4	1	1
FUEL	1-255	66	67	80	70	64	81	85	93	20	17
PAYLOAD	0-63	2	0	2	7	0 (4)	6	6	6	0	3
SERVICE CEIL.	11-41	35	21	37	37	40	21	23	27	39	41
MAX. SPEED	1-41	17	10	19	19	21	13	13	13	20	20
OPT. ALTITUDE	1-31	29	4	17	23	21	12	15	15	25	25
CRUIS. SPEED	1-31	8	7	8	8	9	8	8	10	15	15
CLIMB RATE	1-15	15	8	15	15	15	4	6	8	13	13
FIREPOWER	0-7	4	2	6	6	7	3	2	2	5	5
MANOEUVER.	0-7	5	5	5	5	5	4	4	3	5	5
VULNERABILITY	0-7	5	2	5	5	6	4	4	4	4	5
NIGHT	Y/N	N	N	N (Y)	N	N (Y)	N	N	N (Y)	N	N
TOT. PROD.	[#]	c. 4,900	c. 120	c. 4,600	c. 7,600	c. 290	c. 2,700	c. 7,200	c. 2,930	c. 100	c. 1,900

NAME	[11]	Lightning	Shoot. Star	Ventura	Harpoon	Maryland	Baltimore	Marauder	Marauder	Mariner	Harvard
DESIGNATION	or[11]	P-38J	P-80A	PV-1	PV-2	167A-3	A-30	B-26B	B-26G	PBM-3	AT-6A
ROLE	0-3	0	0	2 (3)	2 (3)	2 (3)	2	2	2	3	0
CREW	0-7	1	1	4	4	3	4	6	6	7	2
FUEL	1-255	23	18	105	102	64	54	53	60	233	42
PAYLOAD	0-63	5	0	7	15	7	7	18	14	12 (27)	0 (2)
SERVICE CEIL.	11-41	41	41	26	24	30	22	24	20	18	24
MAX. SPEED	1-41	21	31	16	14	15	15	16	14	10	11
OPT. ALTITUDE	1-31	25	20	14	14	13	13	15	5	13	5
CRUIS. SPEED	1-31	15	20	8	9	12	12	13	11	7	9
CLIMB RATE	1-15	14	15	11	8	10	8	6	3	3	7
FIREPOWER	0-7	5	6	2	4	3	3 (4)	3	5	4	2
MANOEUVER.	0-7	5	3	3	2	3	3	3	3	0	5
VULNERABILITY	0-7	5	5	4	4	4	5	4	5	4	3
NIGHT	Y/N	N	N	N (Y)	N (Y)	N (Y)	N (Y)	N	N	Y	N
TOT. PROD.	[#]	c. 7,600	c. 10	c. 2,500	c. 540	c. 440	c. 1,580	c. 3,470	c. 1,250	c. 1,340	c. 3,000

AMERICAN AIRCRAFT OF WWII (Cont.)

NAME	[11]	Mitchell	Mitchell	Mitchell	Mustang	Mustang	Nomad	Black Widow	Black Widow	Lancer	Thunderbolt
DESIGNATION	or[11]	B-25D	B-25H	B-25J	P-51B	P-51D	A-17A	P-61A	P-61B	P-43	P-47B
ROLE	0-3	2	2	2	0	0	0	0	0	0 (1)	0
CREW	0-7	5	5	6	1	1	2	3	3	1	1
FUEL	1-255	60	67	67	30 (65)	68	49	54 (95)	111	34	22
PAYLOAD	0-63	10	11	11	7	7	3	4	6	1	0
SERVICE CEIL.	11-41	24	24	24	41	41	19	33	33	38	41
MAX. SPEED	1-41	15	14	14	22	22	11	18	18	17	21
OPT. ALTITUDE	1-31	15	13	13	30	25	3	20	20	25	28
CRUIS. SPEED	1-31	13	12	12	18	18	9	16	16	14	17
CLIMB RATE	1-15	9	4	7	15	15	6	10	8	14	11
FIREPOWER	0-7	3	5	6	4	6	1	4	6	4	7
MANOEUVER.	0-7	3	3	3	7	7	4	4	4	6	5
VULNERABILITY	0-7	4	5	5	6	6	2	5	6	4	5
NIGHT	Y/N	N	N	N	N	N	N	Y	Y	N	N
TOT. PROD.	[#]	c. 4,100	c. 1,400	c. 4,200	c. 3,740	c. 7,960	c. 490	c. 200	c. 480	c. 270	c. 770

NAME	[11]	Thunderbolt	Thunderbolt	Corsair	Corsair	Kingfisher	Vindicator	Vengeance	Vanguard	Peashooter	Shrike
DESIGNATION	or[11]	P-47D	P-47N	F4U-1	F4U-4	OS2U-3	SB2U-3	A-31	P-66	P-26A	A-12
ROLE	0-3	0	0	0	0	3	2	2	0	0	2
CREW	0-7	1	1	1	1	2	2	2	1	1	2
FUEL	1-255	19 (58)	21 (100)	53	46	80	74	35	32	24	32
PAYLOAD	0-63	9	5	5	14	3	4	7	0	1	2
SERVICE CEIL.	11-41	41	41	37	41	13	24	23	28	27	21
MAX. SPEED	1-41	21	23	21	22	8	12	14	17	12	11
OPT. ALTITUDE	1-31	30	33	20	26	6	10	11	15	6	8
CRUIS. SPEED	1-31	18	15	9	11	6	8	12	15	10	9
CLIMB RATE	1-15	11	10	14	15	2	5	5	11	12	10
FIREPOWER	0-7	7	7	6	6	1	2	3	5	2	2
MANOEUVER.	0-7	5	5	6	6	6	4	5	5	6	5
VULNERABILITY	0-7	6	6	5	6	2	3	3	3	2	2
NIGHT	Y/N	N	N	N (Y)	N	N	N	N	N	N	N
TOT. PROD.	[#]	c. 12,650	c. 2,000	c. 8,700	c. 3,500	c. 1,520	C. 240	c. 1,930	c. 150	c. 150	c. 80

Thunderbolt. Most aircraft were Lend-Leased to China where they saw some action against the Japanese in 1943. All USAAF and Australian aircraft used for reconnaissance.

P-47 (THUNDERBOLT). Single engine fighter/fighter-bomber. One of the 'ugliest' aircraft of the war, the 'Jug' was beloved by its pilots for its extreme toughness and resistance to damage. Entered service in 1943 and served in all theatres in fighter and ground attack roles until war's end. The long range N variant was used to escort B-29s from the Marianas to Japan.

F4U (CORSAIR). Single engine fighter. The very best of the USN's fighters, the Corsair entered service in 1943, operating with Marine Corps AGs from land bases. Problems with landing gear and cockpit visibility delayed its use as a carrier-borne fighter until late 1944. Achieved remarkable results against Japanese aircraft in the closing months of the war.

OS2U (KINGFISHER). Single engine observation floatplane. The most widely used USN floatplane of the war and the only US aircraft comparable to the excellent Japanese range of of ship-borne floatplanes.

SB2U (VINDICATOR). Single engine attack bomber. Entered service as a carrier-borne bomber in 1939 and equipped squadrons aboard several CVs until discarded in mid 1942. Saw some use with the Marine Corps while RAF versions were found unsuitable for front-line service and relegated to training duty.

A-31 (VENGEANCE). Single engine attack (dive) bomber. Originally ordered by the RAF in 1940, the Vengeance entered service in 1942 but because of pressing local needs, were retained by the USAAF. Used solely in the Pacific and Burma-India theatres. Some aircraft used later by the RAAF.

P-66 (VANGUARD). Single engine fighter. Produced for a Swedish order, the aircraft went to China as Lend-Lease after the contract was stopped in 1940. Saw action against Japanese fighters 1941-43. USAAF versions used solely for training purposes.

P-26 (PEASHOOTER). Single engine fighter. Relegated to training duties prior to Dec 1941 by USAAF. Philippine AF aircraft engaged Japanese bombers without success while Chinese aircraft were more successful when defending Nanking and Shanghai.

A-12 (SHRIKE). Single engine attack bomber. Obsolete by Dec 1941, the few

FRENCH AIRCRAFT OF WWII

NAME	[11]	(-)	(-)	(-)	(-)	(-)	(-)	(-)	(-)	(-)	(-)
DESIGNATION	or[11]	AM 143M	Am 354B	VG 33C	Ble S.510	Blo 200	Blo 210BN	Blo 131RB	Blo 151	Blo 152	Blo 155
ROLE	0-3	2	2	0	0	2	2	2 (3)	0	0	0
CREW	0-7	5	4	1	1	4	5	4	1	1	1
FUEL	1-255	73	68	37	36	53	80	54	22	19	30
PAYLOAD	0-63	14	9	0	0	10	12	6	0	0	0
SERVICE CEIL.	11-41	26	33	36	29	25	32	24	33	34	36
MAX. SPEED	1-41	10	15	17	12	9	10	11	15	16	16
OPT. ALTITUDE	1-31	13	13	17	16	14	11	12	13	15	15
CRUIS. SPEED	1-31	8	11	12	9	7	7	8	11	12	13
CLIMB RATE	1-15	4	8	14	15	4	5	5	12	10	9
FIREPOWER	0-7	2	2	5	4	1	1	1	4	4	5
MANOEUVER.	0-7	3	4	5	7	2	3	3	5	6	6
VULNERABILITY	0-7	3	3	4	2	2	3	3	4	4	5
NIGHT	Y/N	N (Y)	Y	N	N	N	N (Y)	N (Y)	N	N	N
TOT. PROD.	[#]	c. 150	c. 70	c. 50	c. 60	c. 330	c. 80	c. 140	c. 140	c. 480	c. 30

NAME	[11]	(-)	(-)	(-)	(-)	(-)	Cyclone	(-)	(-)	(-)	(-)
DESIGNATION	or[11]	Blo 162	Blo 174A	Blo 175B	Bre 521	Bre 693AB	C. 714	D 510	D 520	F 222	NC 223
ROLE	0-3	2	3	2	3	2	0	0	0	2	2
CREW	0-7	5	3	3	6	2	1	1	1	5	5
FUEL	1-255	69	51	50	203	55	28	40	28	74	99
PAYLOAD	0-63	26	4	5	3	3	0	0	0	31	31
SERVICE CEIL.	11-41	30	36	34	20	26	30	33	36	26	26
MAX. SPEED	1-41	17	16	17	8	15	15	12	17	11	12
OPT. ALTITUDE	1-31	18	17	17	4	7	16	9	20	13	13
CRUIS. SPEED	1-31	13	12	12	5	9	12	8	12	10	9
CLIMB RATE	1-15	6	12	10	4	9	10	13	11	5	7
FIREPOWER	0-7	2	3	3	2	4 (5)	4	4	5	2	2
MANOEUVER.	0-7	1	4	4	0	4	6	6	6	1	1
VULNERABILITY	0-7	4	4	5	3	4	3	4	5	4	5
NIGHT	Y/N	N (Y)	N	N	N (Y)	N	N	N	N	Y	Y
TOT. PROD.	[#]	1	c. 60	c. 170	c. 30	c. 390	c. 100	c. 130	c. 910	c. 50	c. 10

NAME	[11]	(-)	(-)	(-)	(-)	(-)	(-)	(-)	(-)	(-)	(-)
DESIGNATION	or[11]	Late 298D	LeO 206	LeO 451B	LN 401	MS 406	Po 631C	Po 633B	Po 63.11	Po 65	C.A.O. 200
ROLE	0-3	2	2	2	2	0	0	2	3	2	0
CREW	0-7	2	4	4	1	1	3	2	3	3	1
FUEL	1-255	88	110	85	47	25	55	49	47	38	28
PAYLOAD	0-63	4	8	15	2	0	0	3	3	2	0
SERVICE CEIL.	11-41	21	25	30	31	31	30	26	28	20	36
MAX. SPEED	1-41	9	7	15	12	15	14	14	13	9	17
OPT. ALTITUDE	1-31	7	10	16	13	15	15	14	16	6	16
CRUIS. SPEED	1-31	7	6	12	9	12	8	10	12	8	12
CLIMB RATE	1-15	4	3	6	9	13	11	8	8	5	13
FIREPOWER	0-7	2	2	2 (3)	3	3 (4)	3 (5)	1	1 (3) (5)	0 (1)	3
MANOEUVER.	0-7	3	2	3	4	5	4	5	4	2	6
VULNERABILITY	0-7	3	3	4	3	4	4	4	4	3	5
NIGHT	Y/N	N	N (Y)	N (Y)	N (Y)	N	N (Y)	N	N (Y)	N	N
TOT. PROD.	[#]	c. 130	c. 40	c. 580	c. 70	c. 1,200	c. 300	c. 140	c. 900	c. 80	1

aircraft still in USAAF use were mostly destroyed in the Pearl Harbour attack. Chinese versions operational in early days of the Sino-Japanese war.

French Aircraft

Am 143M. Twin engine reconnaissance bomber. Entered service 1935 and although obsolete by 1940, saw action in day and night roles in the Battle of France. Subsequently served with the Vichy AF in North Africa.

Am 354B. Twin engine medium bomber. Only 50 aircraft were operational by May 1940 because of chronic production delays. Saw limited action in night bombing role. An excellent airframe later used by the Vichy AF in transport and other roles.

VG 33C. Single engine interceptor fighter. Another aircraft arriving too late to have any impact on the Battle of France. Only 40 were operational by May 10th. Promising type.

Ble S. 510. Single engine biplane fighter. Entered service 1936 as the last French biplane. Used by Republican forces in the Spanish Civil War but relegated to second-line and training duties by May 10th.

Blo 200. Twin engine medium bomber. Entered service 1933 and although obsolete, equipped four Continental Groupes in Sept 1939. Relegated to training duties and service in Syria by May 10th.

Blo 210BN. Twin engine medium bomber. Entered service 1935 and by May 10th still operated as the principal medium bomber of the FAF. Used extensively, day and night, in the Battle of France but inadequate performance against modern Luftwaffe types caused heavy losses.

Blo 131 RB. Twin engine reconnaissance bomber. Entered service late 1938. After sustaining heavy losses in daylight reconnaissance of German border, relegated to night, training and overseas duties.

Blo 151. Single engine fighter. Entered service 1938 but poor performance characteristics forced its early relegation to training duties. Saw some action against Italian fighters in the south in the closing days of the Battle of France.

Blo 152. Single engine fighter. Improved version of Blo 151 which entered service in early 1940. Two-thirds remained grounded because of unavailability of correct propellers. Eventually saw some action in the Battle of France and performed well against most Luftwaffe types.

Blo 155. Single engine fighter. Redesigned version of the Blo 152 incorporating increased armament and armour. Arriving too late to see service in the Battle of France, production was later continued by the Vichy government. A small number were confiscated by the Luftwaffe and used as fighter trainers.

Blo 162. Four engine heavy bomber. Only one aircraft completed prior to June Armistice. Promising performance. Prototype used by the Luftwaffe for clandestine operations 1943-44.

Blo 174A. Twin engine reconnaissance bomber. Entered service early 1940 and used exclusively for daylight recon of German airspace. High speed gave protection against fighter interception. Used in a bombing role by the FFAF against Germany in the closing stages of the Tunisian campaign.

Blo 175B. Twin engine attack bomber. Delivered too late to see action in the Battle of France. Served in Algeria and then against German forces in Tunisia after Allied landings. Some 50 aircraft were used by the Luftwaffe in a training role.

Bre 521. Tri engine reconnaissance flying boat. Entered service 1936 and used in coastal patrol work until the June Armistice. Later used by the FVAF in an ASW role.

Bre 693AB. Twin engine attack bomber. Entered service May 1940 and used extensively in the two months prior to the Armistice. Achieved some success but because of inadequate fighter escort, suffered heavy losses to Bf 109s. Used later by the FVAF and in a training role by the Italian AF.

C.714C (CYCLONE). Single engine interceptor fighter. One Polish Groupe operated this type in June 1940 with mixed results. Later used by the FVAF and as a Luftwaffe trainer.

D 510. Single engine fighter. Successor to the popular D 501 series, it entered service in 1936 and saw action in China and Spain before the outbreak of WWII. Relegated to second-line overseas duty prior to May 1940.

D 520. Single engine fighter. The best French fighter of the war. Only 36 aircraft were operational by May 10th of some 2,000 on order. A further 250 were delivered prior to the Armistice and despite pilot unfamiliarity, more than held their own with the Bf 109. Later used extensively as a Luftwaffe trainer and front-line fighter for the Rumanian and Bulgarian AFs. In FFAF colours from 1944 and used in SE France.

F 222. Four engine heavy bomber. Entered service early 1939 and was the only four engined bomber in operational service at the outbreak of war. Used in various roles including maritime reconnaissance, leaflet dropping and bombing until the Armistice. Thereafter in FVAF service in North Africa.

NC 223. Four engine heavy bomber. Entered service late May 1940, immediately participating in night attacks in Germany. Converted for civil use after the Armistice.

La 298D. Single engine torpedo floatplane. Entered service 1938 and used in army ground support role in the Battle of France against both German and Italian invaders. Later used by the FVAF and finally by the FFAF after Aug 1944 in an ASW role. Very versatile type.

LeO 206. Four engine (in 2 tractor, 2 pusher arrangement) heavy bomber. Entered service 1935 and still on front-line duty in North Africa in Sep 1939. Relegated to training and transport duties by mid 1940.

LeO 451B. Twin engine medium bomber. Entered service late 1939 and equipped 10 Groupes by May 10th. As the only modern bomber available in quantity to the FAF, it operated in both a low level, ground attack role and a strategic night bombing role. Later used by the FVAF and briefly equipped one Italian Gruppo.

LN 401. Single engine dive bomber. Entered service 1939 as a carrier-borne dive bomber and equipped 2 escadrilles by May 1940. Used exclusively in a land-based, ground attack role, suffering heavy casualties because of poor performance and inadequate fighter cover. Relegated to night attacks on the Italian Front in the closing days of the Battle of France.

MS 406. Single engine fighter. Entered service 1937 and was the mainstay fighter of the FAF throughout the Battle of France. Its inferior performance against the Bf 109 resulted in heavy losses. Later saw action against the Allies in Syria and Madagascar while many were confiscated and handed over to the Croatian and Finnish AFs.

Po 631C. Twin engine heavy fighter. Entered service 1936 and equipped 8 escadrilles during the Battle of France. Employed in both day and night fighter roles but suffered heavy losses to enemy fighters as well as friendly forces because of its resemblance to the Bf 110. Later used by the FFAF against German forces in Tunisia.

Po 633B. Twin engine light bomber. Entered service 1937, operating primarily in a

training role. Saw occasional employment in the Battle of France as a ground attack aircraft.

Po 63.11. Twin engine reconnaissance aircraft. Entered service 1940 and equipped 40 Groupes by May 10th. Lacking effective fighter cover, suffered heavy losses in tactical recon and ground attack roles. Later used in the Middle East by both the FVAF and the FFAF. Also used by German, Hungarian and Rumanian AFs as a crew trainer.

Po 65. Twin engine light bomber. Entered service 1938 and saw action in bombing, transport and ambulance roles. Used as a transport by the FVAF.

C.A.O. 200. Single engine interceptor fighter. Designed as a successor to the D 520, only one prototype was completed before the Armistice. Promising type although somewhat under-armed. ◆

Letters
Continued from p.4

never get sick of that kind of talk!) I have recommended it to a couple of my miniature wargaming colleagues so hopefully you will end up with a few more SSG enthusiasts in the "Apple Isle'.

You are probably aware that the Backup utility in Russia instructs the user to place the Battlefront master back in drive one. If not, now you know. I trust that the 'What's New' column in *Breakout* 26 which states that ***Road to Appomattox*** has been indefinitely postponed is merely filthy communist propaganda and lies, as I'm sure I wouldn't be the only disappointed customer if that was the case.

Keep up the good work.

Barrie MacDonald

Hobart, TAS.

RTA is really alive and well. . . we will deliver! Grant Garraway, the flatulant and flabby writer of that disinformation, has been soundly chastised for causing our customers unnecessary anxiety.

The game is on our schedule for release sometime in 1988. I can assure you; nobody will be happier to see this project completed than yours truly. It is very likely that the game will take longer to develop than the war took to fight! ◆

Battleaxe
Continued from p.22

British units from the frontier and fouled the British lines of communication and supply.

The German flank assault with the Panzer Grenadier regiments was a rude shock to the British, and their whole Corps was in danger of being enveloped and destroyed. The British player has the advantage of hindsight and can deploy some units to meet the threat from the south. The hardest decision to be made is which formation can be spared. The dilemma which arises is that to breach the frontier requires every available unit, yet the German thrust from the south threatens full envelopment. We will leave it to the player to best determine his own answer. It has been found that whole regiments have ben surrounded and yet managed to fight their way back to the British lines. On a final note; Matilda jocks should stay away from 88s.

As noted in the British player notes, the outcome of the first day's operations will usually determine the ultimate victor. Unfortunately, this is when the German forces are at their weakest. You will initially have to be guided by the strategy that the British have chosen to follow, though you should expect that heavy pressure will be exerted on Group Bach at Halfaya Pass. The three battalions of Group Bach at Halfaya Pass have been given zero movement points to ensure that they do not easily give up those vital hexes.

Do not use the Ad-Hoc division for offensive operations, but rather give it delay or defend orders. Every turn held is a turn closer to reinforcement. Do not be surprised if the Oasis Companies simply vanish during minor combat. The 8th Panzer Regiment should be used as a 'Fire Brigade' and sent where it is most needed.

The second day sees the arrival of the 5th Light Division and the need to change to an offensive posture. Both the 5th and the 8th Panzer Regiments should be used to stabilize the frontier, while the two Panzer Grenadier regiments should drive on Sidi Sulemein. Be aware of your losses as the British get more points for German losses than you get for British losses. How hard you have to push will ultimately be determined by the initial success of the British. The Germans would do well to remember the famous military principle of 'Divide and Conquer'. ◆

Sealion 1941
Continued from p.32

Directly opposing the invasion is a single British infantry division supported by garrison troops and, of course, a lone battalion of Dad's Army. In immediate reserve is a second division, supported by a complete armoured brigade. These troops begin arriving within hours of the German airdrop.

VARIATIONS

To implement the variations for this scenario, I recommend you engage the services of a friend to secretly modify the scenario. The German OB is listed at full strength; i.e. assuming that British air and naval power has had no effect on its arrival. This highly unlikely. You will need 1 six-sided die. Roll the die once for each class 0, 3 or 7 battalion in the 7th Fleiger Division and reduce its strength by the number shown on the die. Roll the die once for each class 0 or 7 battalion in the 6th Infantry Division and reduce its strength by one less than the number shown on the die.

To simulate the effect of the prelimary bombardment on Allied defenders, roll the die once for each coastal defense battalion (i.e. the CD regiment in the 5th Inf Div) and reduce their fatigue value by the number shown on the die. ◆

0	
1 Flgr	11 Mxd Mor
2 Gren	12 75mm PAK
3 Rifle	13 105mmHow
4 Home Gd	14 25 Pdr
5 Pz Gren	15 PzKw III
6 Assault	16 Matildas
7 Bren Car	17 Cruisers
8 Hlf Trks	18 150mm How
9 Armd Car	19 8in How
10 Mxd AT	20 Static

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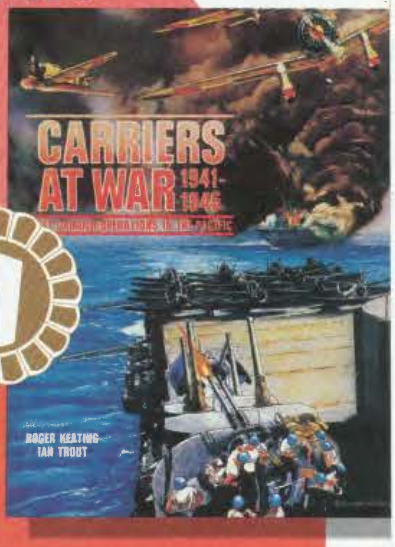

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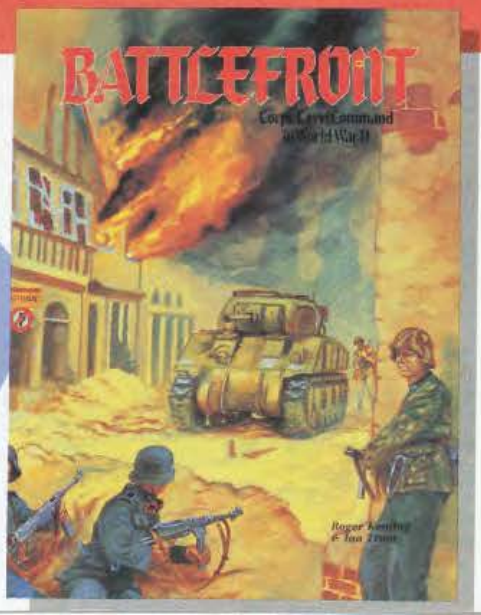

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Class: Archmage
St:18 IQ:18 Dx:18
Cn:18 LK:18
Lvl:18
Experience : 5010118
Gold : 0
Press Any Key...
The Guild
Character Name AC Hit Pts Spl Pts Cl
0 WUMPI LS 447 447 0 0 Fa
1 TOMMY ONE L+ 350 317 0 0 Ro
2 EL CID L+ 568 540 0 0 Ba
3 SAMPSON L+ 511 492 0 0 Ba
4 SLIPFINGER -2 78 67 0 0 Ro
5 PHENGLEI KAI -1 453 453 458 458 An

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3 SAMPSON L+ 511 492 0 0 Ba
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